

**SCIENTIFIC
BUILDING
OPERATION**



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SCIENTIFIC BUILDING OPERATION

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Foreword

IN PRESENTING "Scientific Building Operation" to you we have undertaken to gather and place in one book, the most practical and valuable articles that ever have been written on questions of the management of buildings. These topics dwell comprehensively on the subjects of renting, janitor service, elevators, illumination, buying supplies, cost data and comparative percentages.

There is no attempt on our part to present this book as an edition of entirely new ideas on the management of buildings, yet what we have gathered together in the following pages will be found of practical value to any manager or owner of buildings. While it is in no way a primer on the subject, we have been very careful to eliminate such technical terms as would confuse the average layman, thus making it a book for popular distribution among those interested.

Many of the articles herein contained will be remembered by subscribers to BUILDING MANAGEMENT as appearing in times past in that magazine.

Our endeavor has been to carefully select from every available source the best treatment of the subject, but even in this our judgment may be questioned. However, we feel reasonably sure that the contents will merit the approval of our readers.

In preparing this book we feel some pride in the fact that it is the first book ever published on the subject of managing buildings after completion.

While volumes by the score have been written about building architecture and engineering, this is the first presentation of a book to aid the owner and manager to secure a proper dividend at a minimum operating cost from a building erected.

THE EDITORS.

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PART I

Management

Systematic Office Building Management

By J. E. Randell

WHILE it is all important that a building shall be so constructed that it can be operated economically, it is equally, and perhaps more important that the manager in charge of the completed building shall have had sufficient experience to be able to take every advantage in avoiding the expenses so easily incurred by the multitude of small details in which money can be spent without benefit to the building.

The operation of a large office building representing an investment of millions of dollars is as difficult and intricate to control and manage as any other business requiring a large capital. The results in dividends are no less eagerly awaited by the individuals who hold the stock, or own the property than are the dividend results of any large sales corporation. It should, therefore, be not only the policy, but the duty of all managers to reach out unceasingly after the things that work toward efficiency, coupled with economy; and what better method is there than a convention of this kind, which brings together the best talent from all the different cities on this continent, for the purpose of exchanging experiences and listening to ideas from one locality which may be new to persons operating in another.

I have been requested to touch on

- (1) Follow up system for prospective tenants.
- (2) The selection of tenants.
- (3) Space utilization.
- (4) Labor.
- (5) Purchasing.
- (6) Minor mistakes of installation during construction.

(1) The follow-up system which has proved of most service to me in filling a new building is very simple, and for that reason probably effective. When I solicit a prospect or receive an inquiry for space I give my secretary a memorandum containing the name, address, nature of business and telephone number. These memoranda are noted on the same line, directly under each heading, so that at a glance I can see that the prospect is Tom Jones Company, 1127 Century Building, Lawyers, Central 1095. A line is drawn under this to make it easily seen. On the sheet I keep a memorandum of each interview. For instance:

August 1st, 1909.—Mr. Jones said he could not consider space because location is too far from court house. He needs 3,000 feet, is paying \$1.60 per foot. Lease expires April 30, 1910.

August 10th, 1909.—Gave Jones plan of Nos. 1112 to 1126, showing how office could be arranged. Spoke of fine light, proximity to elevators, showed list of other prospective tenants, explained how central our location is for most people. He says he will not consider space, but will see it before deciding finally.

August 15th, 1909.—Called up Jones and made appointment for 1:00 p. m. tomorrow to show him space.

August 16th, 1909.—Jones saw space, liked light and depth of office,

asked for figures and blank plan. Offered him 3,000 feet at \$1.90 per foot per annum.

August 25th, 1909.—Called up Jones because Johnson Company are looking at space. Jones says give until August 27th for him to decide—will not increase his present rental more than \$500 per annum—says our space divides economically.

August 26th, 1909.—Called Jones for answer—he will call at 9 a. m. tomorrow.

August 27th, 1909.—Closed 2,650 feet at \$1.80. Executed. Returned it after getting proper signature.

August 31st, 1909.—Received lease from Jones. Returned to him for partner's signature.

September 1st, 1909.—Received lease properly executed. Returned it after getting proper signature.

This is a fair sample and covers each step in the transaction.

These prospect sheets are kept alphabetically in a file. Before filing, however, a memorandum slip is made and placed in a diary file, calling attention to the time for the next interview. Each day the memoranda are taken from the diary file and placed before me so that none can be missed and the element of chance is eliminated. If any prospect is out of town, another memorandum is placed in the diary file so that it will appear again on his return—perhaps a month afterwards.

It is easy to look at the daily memoranda and then refresh your memory from the prospective file by seeing exactly what you have said or done with a man before seeing him again. If the prospect does not take any space, the memorandum can be removed and filed in a "Refused" file.

On the selection of tenants depends the reputation of the building. It has been said that to have an office in certain buildings is like a rating in Bradstreet's or Dun's.

A new building is always beset by a host of schemers, who wish to trade on the name of the building, knowing that the advertising incident to the erection of a prominent building will go far toward instilling confidence in the minds of their victims. These people will have a cut of the building on their letterheads as though they owned it, and woe unto the man down in the country who puts up his savings, thinking the scheme must be good, and woe unto the reputation of the building which harbors such schemes.

In Chicago there are agencies which make a business of looking up reputations and I have found a contract with one of these a splendid investment

My chief trouble is with undesirable sub-tenants or desk roomers, who sometimes creep in unnoticed to share an office with someone already holding space.

In our eagerness to lease space we have probably all been tempted to accept some person who is balanced on the fine line separating the "near desirable from the undesirable," but it is unquestionably a good rule to hold space vacant rather than accept undesirable tenants. Their mal-odor will permeate the entire building and attract other birds of prey until the name of the building becomes a byword and the manager a laughing stock of his competitors.

For years I have been a pronounced opponent of office space which cannot be naturally lighted. There are two cardinal points which can either make or break a building. The first is light, the second is location.

I heard a Chicago architect argue that the more rentable floor area there is in a building, the greater the revenue will be, and this sounds logical, but in the years I have spent in connection with office buildings I have found this statement to be absolutely disproved. The fact is that the more naturally lighted rentable floor space there is in a building the greater the revenue will be, but who is foolish enough to lease dark space which it is necessary to light artificially if naturally lighted space is available? It is against reason, because a tenant is then assuming the expense of a lighting bill in addition to his rental. It has been argued that the light is furnished in some buildings without charge to the tenant so that he does not feel this extra expense. In that case the building feels the extra expense in its coal bill. To illustrate this point let us consider a building on a corner facing two streets and constructed so that it has two wings with a 60-foot court between. The offices facing the street will naturally have good light, provided they are not over 25 feet in depth; the court offices, however, depend entirely on the width of the court for their light. If the offices facing this court are made deep, say thirty-two feet, how will the ten feet farthest from the windows be lighted, on the floors below the center line of the building? In order to get two private offices and a reception room, a tenant must take at least twenty feet frontage, or 640 square feet, and in order to make up for the deep reception space, which it is necessary to light and furnish, the rental must be reduced rather than allow the space to lie idle. How much better would it have been to have made the light court wider and the court offices not so deep, say twenty-two feet. The same price would be obtained for the two private offices and the reception room without question and the rate per square foot increased accordingly. Why, then, is it necessary to build the extra ten feet of depth across the entire length of each wing? The original investment would have been, perhaps, \$100,000 smaller and the returns would have remained the same. You may ask how do I know the same price could be obtained for the shallow offices. My only answer is that during the years I have spent at this work in connection with a number of buildings of both kinds, this has been my experience, and for that reason I am convinced.

In these days good service in a good building is expected and furnished, but good, natural light is the molasses which catches the tenant. Natural light means satisfaction for, and better work from, his employees and a minimum expense for artificial illumination. It keeps the tenants praising the light offices and so advertising the fact to others who may subsequently become tenants.

The two principal items entering into operations are labor and supplies. Labor runs into money faster than any other expense. It takes a great deal of study and individual investigation to be able to satisfy one's self that each man is giving his full energy. Where one janitor can be done without it saves \$600 per annum. In working out a labor system for my building, I looked over buildings using women to do janitor work instead of men and found that to do my work with women would increase the cost \$1.18 per floor per night over that incurred by using men, except for scrubbing. This looks like an insignificant amount, but when you figure 19 floors at \$1.18 each for 307 working days, you will find a saving of \$6,882.94 per annum.

We have about 20,000 feet to a floor. On that floor I use two janitors to do the sweeping, and we don't use any women except for scrubbing. I

have a regular force of scrub women, about 20 of them, who scrub a certain space every night. A woman scrubs approximately 4,000 feet where she has to move furniture. In some other buildings they use the women for doing all the sweeping, but the women cannot move the furniture, and they waste more time than they gain. It is too heavy for them. They will waste half an hour trying to struggle with a desk when a man would move it in half a minute. They cannot reach up high enough to clean woodwork and it is dangerous to put a woman on a step ladder.

My men clean about 10,000 feet a night each, working $9\frac{1}{2}$ hours. It is very hard to regulate that. On some floors it will take a little more than one man to do the same amount of work. On that floor you have to take the man from the next floor to help him. The next floor may be an easy one with large space, I mean large open space, not many heavy rugs, bare floors, so that you will have to even it up. It is a little hard to set rules. The women are paid 18 cents an hour in Chicago. The janitors are paid 20 cents an hour. The women work up to 11 o'clock. The men work all night, with a rest from 11 until about 3. There is two cents an hour difference between a man and a woman, and a man can do a great deal more work than a woman can do in an hour.

Of course we all carry liability insurance to protect our building from personal damage suits. Under our policies the insurance company takes charge of the case as soon as any one is injured and we are not permitted to interfere in any way with their disposition of it. We cannot advise or suggest anything to the injured, nor do we wish to. This feature is perfectly proper, because the insurance company has to pay the bills; but how about the person injured? If that person is an employe of the building and is injured in the discharge of his or her duties, it seems extremely heartless in an employer to sit back until the insurance company can starve or coerce the victim into a settlement. Is it your custom to abandon the employes to the insurance company, or do you assist them for a reasonable time until they are on their feet again? I bring this up because some persons think I am a "soft mark" in cases of this kind. The expense of seeing that the little comforts are provided has never cost me more than the employe's wages for one month, and seldom more than half that amount. During a year the average will hardly be more than three accidents in one building.

It is equally bad when a steady employe who is really ill and unable to work for his or her pay to stop immediately on the date of such illness. I know that there are a large number of floaters who work here today and somewhere else tomorrow, but the regular employe is the one I refer to—the man or woman who has been with you long enough for you to feel that the work expected of them will be done properly and at the proper time. I have in mind the case of a woman who had worked for me for two years and suddenly became ill. She had three children dependent on her. Her wages amount to \$30.00 per month as a scrub woman. There was no accident, just illness—temperature at 103 and pulse 120. Too poor to have a doctor or buy food for the children. In this instance, of course, I had her cared for temporarily.

In another case I had a man whose arm was so badly crushed that it was necessary for the member to be removed. I felt duty bound to see that the man got proper attention and did not lack the necessities during his two months' illness and put him to work again at odd jobs on his return. Without question the attention he received made him willing to accept a favorable

settlement with the insurance company. The money spent, however, was not with the sanction of the insurance company and, therefore, could not be collected from that source.

I would like to see a universal method adopted by building managers which would abandon the heartless way of casting off an employe, like an old glove, when he meets with serious damage or sickness while in the discharge of his duties. In my judgment we spend money for a hundred things around a building which do not prove as good an investment as one-half pay up to, but not to exceed, two months for an injured or genuinely ill employe who is laid up for more than one week. In saying this I do not intend to cover the employes who may be absent through drunkenness or shiftlessness. These should be discharged instead of being assisted.

Where the purchasing is done by the engineer, chief janitor and superintendent, I have observed that it has generally proved unsatisfactory. In my judgment the men who superintend the use of materials—I am only speaking of one building, not an aggregate number of buildings—should always be consulted regarding the most efficient supplies for specified work, but should never be in contact with the salesmen. If all purchasing is done in the manager's office by one man who makes it his business to keep an alphabetical card index of purchases, his price list will always be up to date and accessible if the manager wishes to look it over. I find that the engineer, janitor and superintendent prefer this arrangement, because it puts them in a position where they cannot be suspected of graft. These men can inquire regarding prices at all times and suggest trials which they think will prove more economical. They can watch the result of experiments with new material with as much interest as the manager himself, because they are naturally anxious to make the best possible showing both in results and in the cost of such results.

A few things improperly installed make no end of trouble and expense during the subsequent operation of an office building. One of the things which, in my humble judgment, should be made obligatory on architects is the use of galvanized pipes for all plumbing. The inside of a waste pipe soon becomes coated with a slimy protection which prevents corrosion, but dampness collects on the outside, especially during the summer months, and causes heavy rust, and it is only a matter of time until a leak will be discovered and then the tearing up and the consequent expense commences. Vent pipes rust on the inside and become clogged with scales.

The urinals are usually arranged in the same location on each floor and are often cross connected with the janitor's slop sinks, so that the water supply to either cannot be shut off without shutting off both. There is no object in having the urinals flush every six or seven minutes during the night, and for a man to climb up and shut off the supply to each urinal tank in the building at night and turn them on again each morning would prove entirely too expensive.

The urinals should have independent runs of their own with a shut-off valve in the attic as well as at each tank, so that a man can turn one valve and stop the water waste in less time than it takes to tell it. The separate run will pay for itself in six months in the saving of water.

See that the architect locates the water and waste outlets for wash-bowls on the columns along the corridor walls and not at right angles to the columns, where they obstruct the space and from which position you will be obliged to move them in dividing space for tenants.

A central toilet room in a large building becomes a heavy burden on the elevators on account of the necessary inter-floor traffic occasioned thereby. The installation of a small toilet space on alternate floors proves of great benefit to the service because the majority of persons will walk up or down one story rather than take an elevator. The cost of installation is heavier than that occasioned by a central toilet, but the subsequent results, when the building becomes filled, will be most gratifying. I took account of the number of people traveling in my elevators a short time ago, and we are carrying 24,230 people a day. That included all that inter-floor traffic, because we have a central toilet room on the eleventh floor. People go to and from there. The population of the building is not over 3,000. I know it is not easy to guess at the population. I have had people guess 15,000. But by the actual census in the building the population is about 3,000.

In my judgment the installation of a filter system, except for water to be used in the boilers, is a waste of money. An ice machine to cool drinking water for tenants is as unnecessary as it is unappreciated. It is human nature not to appreciate something which costs nothing either in money or bodily comfort. The lack of filtered water to wash in and filtered and cooled water to drink is no hardship for the average tenant. He will buy spring water and ice, which are kept in his cooler and operated without cost to the building. The filter and cooling systems are expensive to operate and keep in repair, and, as far as my experience shows, carry no weight in getting large rentals. In renting our building I never mention the fact to anybody. In fact, before they ever knew that we had any filter system in there or any ice water, I had it cut off and they don't know it to this day, and we get the rent. The architect put it in. That was part of the game.

Elaborate ventilating systems are too often unnecessary after the building is fairly in operation, because you subsequently find a way, generally, to provide natural ventilation in order to avoid the expense of operating fans.

Good natural light in offices, plenty of artificial light in halls, adequate elevator service, good janitor service and prompt and cheerful attention to complaints—and probably that carries more weight than anything else. You have to be right up and doing when there is a complaint. Don't fire them out of the building. That will do more toward keeping an office building full than furnishing the tenants with luxuries which are expensive to install and operate, and which cannot be abandoned when once the tenants have had them.



Qualifications of a Building Manager

By Alfred Higbie

BETWEEN the thousands of tenants in our large office buildings, who want the best there is to be had, and the corporate interests who own the building, and who are constantly demanding large returns, stands the man in charge of the building. It is this determined individual who has been developing himself during the past few years, and who must act as arbitrator or referee between the owner and the tenant, and be able to satisfy both, that has come to be known as the "Building Manager."

The manager of properties, and office buildings in particular, must be a man peculiarly adapted to this particular line of work. The field is so broad, in respect to the different lines with which he must be familiar in order to be a successful manager, that it is a difficult task to outline all of the numerous details which he must have stored away in his ready reference book (his mind) where they can be drawn upon instantly, and with accuracy.

The manager of a large office building comes in contact with a great many people in the prosecution of his work. These people belong to all stations in life, from the millionaire to the humble janitor who cleans the toilet rooms, and in mingling with these two extremes of human nature it would be bad policy, indeed, for him to assume the air and dignity of the millionaire, or stoop to the level of the janitor, but he should be able to adjust himself to both extremes and carry himself in a manner that will command the confidence and respect of them both.

If the manager is engaged before the lot is selected, or the building planned, the burden of responsibility rests upon his shoulders as to whether or not the building is rightly located and rightly planned.

The proper locating and the proper planning of an office building is a huge load for one man to shoulder, especially if he is assuming that responsibility in a city with which he is not entirely familiar. In this case he should not assume to choose the location without advice. Although his advisers may know absolutely nothing about office buildings, he can get from them certain facts which he must have in order to make the correct selection. They can advise him as to the streets on which there is the greatest amount of traffic; the all-important point of getting in, or as close to the financial center as possible; the location of the courts and post office; the corners where the greatest amount of transferring from the local street car lines is done; in which direction, if any, is the natural trend of the business section. After carefully weighing all of these points, and getting informed on any point that may not be perfectly clear to him, the experienced manager should have no trouble in making the proper selection.

There is none of you who, in your home city, could not point out the best location for an office building as soon as the question was asked, but

if placed in another city, where the conditions are entirely foreign to you, you would find it an entirely different proposition.

In the planning of an office building, there is almost as much responsibility as in locating the site. As I have stated before, I believe the architect is the proper person to make the preliminary drawings for any building. (When I speak of buildings, I am referring to buildings such as most of us are connected with, anywhere from eight stories up.) But when the plans are being revised, re-drawn, torn down and built up, the experienced manager has a chance to show the value of his experience, genius and idea-creativity. It is up to him to revise those plans in such a manner that the building, from a rental standpoint, will derive the greatest return on the investment.

There is a "best place" in every building for the corridors, stairway, elevators, toilets, janitor closets, etc., and it is up to the manager to find these "best places." There are only two reasons why these places should not be rightly located. First, on account of the inexperience of the manager, and in this case he should consult with some one who does know. Second, if the manager is an experienced man, and these conveniences are not rightly located, he has missed his calling and the sooner he gets out of this line of work the better it will be for him and the owner of the property. There is not one chance in a thousand for the manager to make a success unless he has climbed the ladder and earned his position through steady progress.

The majority of office buildings put up today are built for revenue purposes alone, and if an experienced man is on the ground he should and will act as a safety valve on those who would add to the architectural beauty of the building at the expense of the rent producing qualities.

Any and everything which will detract from the desirable renting qualities of the building should be eliminated, while everything in the way of rent influencing factors and conveniences should be added.

One of the places where the experienced manager can render the most valuable service is during the construction of the building. He can and should be of inestimable value to the architect and the sub-contractors. He should be consulted and able to give expert advice on the following subjects:

As to the system and number of elevators to be installed.

As to the speed of the elevators.

As to the weight of the elevator doors.

As to the kind of finish of the woodwork throughout the corridors and offices.

As to the style of plumbing to be installed.

As to the general arrangement of the entrance and lobby.

As to the style and strength of the glass to be used in the doors and corridor partitions.

As to the arrangement of the alley entrance and freight elevator.

As to the location of wash stands and lavatories.

As to the arrangement of the corridor and office lighting.

As to the arrangement of the different risers for the heating system.

As to the arrangement of the heating and power plant.

And last, as to the arrangement of the different offices, providing the partitions are put in before the offices are rented.

He should be able to adjust the rents at a figure which is as high as the offices will rent for, but not high enough to drive prospective tenants

away; to figure the annual rental of every office in the building, regardless of the location on the floor, also regardless of the location of the building, in such a manner and at such a price as will bring the best returns for a building of its class.

In establishing the rentals of a large office building a great many things must be taken into consideration—the location, the quality of the building, the conveniences, the service, the amount of light in each individual office, the ventilation, etc.

He must be competent to select the most capable men for the heads of the different departments, men who know their work, when and how it should be done, and will see that it is done when it should be, and as it should be. To do this in such a way as will produce the best results, he must be a good student of human nature. Be sure that every employe carries out the spirit of the management. If he does not, eliminate him. On the other hand, give him credit for any new innovations he may introduce which tend to reduce the time or cost of his work.

He should be so familiar with local conditions that he can tell whether or not it will be to the advantage of the building to have work done by the day under his own supervision, or have it done by outside contractors.

He should know the prices of the different building material which he is called upon to purchase very frequently, and the prices of labor, such as plumbers, steam fitters, carpenters, bricklayers, plasterers, painters, electricians, etc.

It is not necessary for him to be a plumber, but he should know where the different valves are located, and what they are for, so that if it became necessary for him to shut the water or steam off from any part of the building he could do so without calling the engineer.

He should be enough of an electrician to know where the different switches are located, what machines they control, and should be able to throw them off in case of an emergency.

He must be familiar with and able to select the best grades of soaps, powders, polishes, mops, brooms, brushes, and the various supplies which it is necessary for the janitor to have on hand at all times.

In order to keep your finger on the pulse of the expenditure, to know what and when a thing is being bought, and at what price, it is necessary that all supplies be purchased through the manager's office. In this way you can advise with the heads of the different departments when they come to you for supplies, and ascertain if certain supplies are giving the anticipated or expected results. It is not sufficient that you audit the bills as they come in, but you must purchase the supplies yourself in order that you may have that intimate knowledge of the quantity and quality of the supplies that it is so necessary you should have.

When you purchase the supplies yourself you remove certain temptations which otherwise would surround the heads of the different departments, and with these influences removed, they will only recommend those supplies which give the best results. If the manager is on the job and discovers wastes and leaks, his employes will discover them, too, and the building will thereby receive a double benefit.

The cost of maintenance of any building depends on two things. First, the character and location of the building. Second, the man who runs it.

When a tenant moves into a new building he must take his chances, and the word of the manager, as to the quality of service he is to receive,

but after a few years when the building has become established the quality of service will regulate, to a certain extent, the demand for offices in that particular building. Watch your service carefully. Good service will not only hold old tenants, but draw new ones.

When you promise to do a certain thing for a tenant, do it as soon as possible. Don't procrastinate. Promptness is one of the most important features in the management of an office building.

It is very important that you should know the name, number of the office and business of every tenant in the building. You are very frequently asked the office number and business of Mr. So and So, how long he has been in the building, where he came from, and how he is considered financially. In fact, you are not considered as being on the job unless you know the pedigree and family history of every tenant in the building.

One of the best things to guide and help you settle certain questions which arise from time to time, certain conditions in your leases, and any other papers with which you may have to deal, is a course in Realty Law.

The most of you who are managers of large office buildings have an attorney on the board of directors, or one who is a stock holder in the company, who directs the affairs of the building, and upon whom you are at liberty to call whenever you may need his services. But it is a source of great satisfaction to be able to settle a great many questions composed of one-half law and the other half horse sense, without calling on your legal adviser for instructions. The latter knows there are many questions of landlord and tenant to be settled in connection with the operation of a large office building, and he also knows if they are not settled or adjusted in the proper manner they will ultimately come to him. If they do not get to him he knows his company has a man on the job who is perfectly able to look after and adjust these questions without calling for assistance.

The attorneys for most of our large corporations are employed by the year, or given a certain amount of stock in the concern for their advice in directing the affairs of the company. Court the friendship of your attorney. Keep him advised as to the condition of affairs. After you have settled a matter, go to him and tell him what you have done and how you have done it.

There will come a time when you may want an increase in your salary, or some unprogressive member may want to remove you for spending the money necessary to keep the building up to date, but at these times the advice of your attorney will be asked, and you may rest assured that it will not be adverse to your best interests if you have shown him you are capable.

Be broad, liberal and open-minded toward your tenants' ideas and methods. It is a splendid idea to occasionally look at your problems from your tenants' standpoint, but settle them from your own.

If your shoulders are to assume the responsibility, your brain should dictate the decision.

Adopt a positive attitude in all dealings with your help and tenants, but remember there is no rule so "iron clad" but in the hands of a person with an average amount of common sense, has a certain amount of elasticity.

If a tenant asks for anything which is a little out of the ordinary, the manager should be able to size up the situation in a second. Take into consideration the time he has been in the building, the promptness with which he pays his rent, the reasonableness of the requests he may have made in the past. If his previous demands have been moderate; if he has

paid his rent promptly, and has been a good tenant with all that the term implies, and you would not be flagrantly violating your rules and regulations by granting the request, grant it.

Be very careful not to get on such a friendly basis with your tenants that they will be tempted to ask for certain fancy decorations or extras, which they know they could not get without the advantage of the "friendship club" which some of them would be unscrupulous enough to swing over your head if given the opportunity. Be on a friendly basis with all of them, but show no favoritism or partiality, as it will lead you into many an embarrassing position if you do.

The following paragraph was written by C. A. Patterson of Building Management:

"The manager of a building is mayor, police, health and street cleaning commissioner, and department of public works to a community of several thousand people under a single roof. So vast has this real estate field become that no man can possibly know it all and the higher the building specialist develops, the greater success will be the building from an investment standpoint."

No writer has ever made a truer statement than the above. At the same time the progressive building manager has the satisfaction of knowing that while he is developing his building to the "Peak Load," so to speak, he is developing himself so that he will be ready at any time to assume greater responsibilities and achieve greater successes.

The business of managing office buildings has developed so rapidly within the last few years that it has come to be known as a new profession. This development has been so rapid that it has been only within the past year or two that the building manager, as an authority on planning and equipping an office building, has come to be recognized by owners and architects generally. Many buildings have been erected during the past year with an active Building Manager in direct consultation, and it is not a difficult task to look into the future and see the time when every architect, who is planning a building of any importance, will have a building manager in consultation. Now a new problem confronts him, namely that of his compensation. There are now no standards to go by and I believe we should adopt a percentage, based on the amount of work necessary, so that all managers competent to handle this class of work can have a guide in this connection. Many requests have been made for a basis from which to figure this percentage and this body of men are the logical ones to answer it. Architects, as many of you know, work on a minimum percentage of five or six per cent of the total cost. Why should not the building manager have a percentage to work on? The establishing of a basis of percentage for the building manager's services, when he is giving expert advice, will do much to elevate this new profession and formally establish it in the eyes of owners and architects.



How to Become a Manager of Business Properties

By Charles E. Duross

MY advice to a man starting out in real estate, who wishes to build up a business in the management of business property is, first of all, after a course of study in the theory of real estate, to get right out in the field where he can gain the actual experience under the guidance or in the employ of someone who has business property to manage. It is not enough to know the theory alone, one must have the practice as well, in order to avoid serious mistakes that might prove costly to himself or to the property which he represents.

Having had, therefore, a thorough knowledge of the theory by the course you are wisely pursuing in this excellent school of learning and the actual experience by working in the field, the main question then is to get the business, that is, the property to manage. A man may be ever so expert, conscientious and practical, but that alone will not bring him bread and butter, if he has not the property to manage. He must get hold of the property. You must convince the owner that it is to his best interest to place his property in your care. This can be done in various ways, and right here is the crucial test. Sometimes it is done through friendship with the owner or through acquaintance with friends who may have influence with owners; often business is acquired through a judicious location of an office. But I have found the most fruitful results to come from a careful study of the wants of the business man and the manufacturer, backed up, of course, by industry, tact and perseverance.

To illustrate more clearly my meaning of the needs of the business man I will describe a concrete case which actually took place in my own experience. Several years ago, down on the lower West Side, in the vicinity of West Washington Market, south of Forty-fourth street, it was proposed to build the new Chelsea docks, and to do this it was necessary for the city to acquire title to considerable of the upland then used by the beef houses, poultry and provision dealers. The idea occurred to me that if a suitable location could be found it might be practical to move all these dealers in the allied market trades in a body, and this would mean good business for the broker as well as a solution to a perplexing problem to a large number of tenants. So I set out to work on the project, interviewing a number of the more influential concerns to get their ideas as to the essentials required, such as location, buildings, railroad track facilities, etc. Then I made a thorough canvass of the available property. A location was found which could be suitably improved and which could be connected with the railroad tracks, providing a franchise could be obtained from the city government. To get this franchise it was necessary to go to the Board of Aldermen, and finally to the Mayor, whose signature was necessary to make the franchise legal.

After all these things were in shape the next step was to find some

one concern courageous enough to undertake the purchase of the land and the erection of the buildings and the cold storage plant.

Finally one firm was found that saw a handsome profit in the enterprise. A block front on Tenth avenue between Thirteenth and Fourteenth streets was secured; the buildings were started and the enterprise was soon on a sound basis. All these different steps to the transaction were tedious and trying to the last degree, yet they netted good commissions to the broker. But this was not the end of the deal so far as the broker was concerned. While all this took place nearly ten years ago, my firm is still drawing commissions from the management of those twelve or fifteen buildings, occupied by such strong tenants as Armour & Company, Morris & Company, the G. H. Hammond Beef Company, Cudahy & Company, The National Packing Company and many others.

The steady income to the real estate office looking after business property is one of the surest sources of profit. I mention this case merely to show you how business may be secured by laying a plan to get it and following up that plan.

The property having been secured, the cares and burdens of the agent are only beginning. The agent should endeavor always to have the good will of the tenants and, of course, should study to find ways and means to make the property in his charge productive and profitable to the owner. I once knew an agent who worked very hard to get property in his charge and he showed great cleverness and ability in that line, but after a while he seemed to relax his efforts and allow the buildings to run down, his tenants became dissatisfied and some moved out. Now, no landlord is satisfied to have vacant buildings, especially for a long time. And so my friend finally lost the management of the building and eventually he went out of business. This man was something like the old time ward politician who worked hard around election time, and after election worked his friends in office until he landed his job, and when he began drawing his salary from the government he considered it was for the hard work he did in getting the job and acted not at all like a public servant, but like the public's boss. This is a great mistake for anyone who intends to become a successful manager of property, and especially business property, which of all kinds requires the most study and the exercise of the best judgment.

To manage a business property successfully two things should always be kept in mind: Keep the property fully rented by a careful selection of tenants and keep down expenses or fixed charges. It is essential that you should go frequently amongst your tenants, talk with them, learn the requirements for the accommodation of their business as they themselves will explain them to you.

The agent is the man who gives service to both tenant and owner, gives it cheerfully and quickly, and denies it just as cheerfully, and withal so diplomatically as to make the tenant have confidence in him and in any event to feel that he is being treated justly and with proper consideration.

The agent should be the first to detect a tendency in any trade occupying space to change the trade center or locality. It is well to be alert in this respect in order either to counteract that influence or to aid it on by finding tenants to take the place of the departing ones. Sometimes in the space of a year whole buildings rented in lofts have changed entirely the character of the tenants within their walls.

To keep buildings rented requires tact, perseverance and foresight of

a high order. From three to six months before expiration of leases one should lay out a plan for new tenants or renewal of leases with old tenants, if they have proven desirable. It is usually better to keep old tenants than run chances on getting new ones. This is on the theory that "the Devil you know is better than the Devil you don't know." Repairs and alterations are generally less expensive and costly when old tenants remain and renew their leases. It is good policy also to make repairs for old tenants, even before it is an absolute necessity, to keep your tenant from moving. The reason is that a satisfied tenant is the best asset a landlord or an agent can have. It is well to anticipate necessary repairs and by so doing you may often save considerable expense to the owner and keep the property up to its greatest efficiency. The property which is kept up in proper repair when the dull renting time comes, as it is bound to after panics and during periods of depression, is much more apt to keep its tenants than that which is allowed to run down and drift along. Nothing gives a reputation for success to an agent like keeping his property fully rented and in good physical condition. You all know that oft-repeated axiom, "Nothing succeeds like success." This is true in the management of property as in any other business. To hold your tenants it is important to always keep your temper unruffled, never allowing yourself to seem impatient or grouchy. On the contrary you must show every sympathy and interest in their undertakings and enterprises. It will not do the agent any good to assume the attitude that the tenant exists only for the sole purpose of paying rent.

The necessity for an agent in the management of business property is apparent to anyone giving it a moment's thought. A conscientious agent who knows his business saves the owner more than the amount of the commission paid. The average owner of business property is himself a business man who cannot afford to spend the time necessary to give the property proper care and attention, hence he must depend on someone else to do this important work for him. No one can do this more efficiently or economically than the agent. The average building will not afford the services of a superintendent, who is competent to look after the repairs and rent space. The agent who specializes in business property is in a position to do this work. He can have repairs done at the lowest cost because he is constantly in touch with contractors who are most efficient in their several trades, and more important, he has the best facilities for keeping the buildings fully rented. He knows best the market value of the space, and this expert knowledge is worth a whole lot more to the owner than the commissions paid on rents collected.

It is the agent's business to manage the property in his care; to bring out the best results not only for a month or a year, but continually without break, year after year.

The proper management of business property involves a great deal more work than merely renting the buildings and collecting the rents. The agent is usually expected to perform many other services for the owner, such as looking after the water rates, tax bills, fire liabilities and plate glass insurance; the hiring of employes, such as elevator men, firemen and engineers. He must also pay these their wages weekly. He must get estimates for the necessary repairs to the property and keep a close watch on the work while it is in progress. There are also electric and gas bills to be attended to, besides all the endless orders that sometimes come from

the Board of Health, Bureau of Factory Inspection, Bureau of Buildings and other state and city departments.

When all these details have been carefully looked after the agent need have no fear that he is in danger of losing his employment. There is no other business or profession I know of where so much service and attention is given for the fee charged. The landlords, as a rule, are appreciative of their agent's work and quite often very confidential relations spring up between landlord and agent. Indeed, I know of agencies which have had the management of business property for generations and the present owners would no more think of taking the management away from their agent than turning their property over to the state for a park use.

Although a great deal of work and care is a necessary result of the management of business property, yet it is generally admitted to be desirable business for a real estate office to have at least a certain amount of such business. New York City is growing so rapidly and business property is spreading out over so large a territory, especially in the section below Central Park, that agents in lower Manhattan will do well to develop that branch of their business which looks to the management of business property. The really large commissions are received from selling, but the office that has the management of property is the surest to get these whenever the property comes into the market, for the reason that he is in closest touch with the owner and best understands the conditions under which the property is offered. The agent who has charge of the property has another advantage in selling over the outside broker, because he can speak with authority regarding the income and expenses of the property which he manages. The buyer usually wants reliable and convincing evidence before he invests. After an investor has acquired a property he is very liable to retain the agent in charge who is familiar with the tenants and who has proved his ability by his previous experience.

In taking charge of business property, great care should be given to secure tenants in the same building congenial to each other. Otherwise conflicts and annoyances may arise; the tenants will be unable to get along among themselves and will be dissatisfied with their surroundings. For instance, it is obvious that manufacturing concerns and selling agencies or commercial firms should not under ordinary circumstances occupy adjoining quarters in the same building, likewise it would show bad judgment to place printers and publishers in the same building with milliners and dress-makers. This matter usually works itself out to the satisfaction of all concerned, as tenants are themselves very cautious about renting space in buildings where other tenants are not congenial. However, the agent is often called on to pick and choose his tenants. This one condition alone is sometimes enough to cause success or failure in the management of a building. Therefore, great care should be taken in getting a building well rented at the start.

Success resolves itself into a question of honesty of purpose, energy, ingenuity, efficiency, enthusiasm, diplomacy and salesmanship. After all is said and done we do not attain success in this business by rules and precepts alone. It requires considerable study and attention, it is true, but besides this and beyond it requires a generous use of shoe leather and hustling, backed up by common sense and judgment. The real estate agency and brokerage business is one of the most active professions a man can engage in. As soon as a man becomes inactive, his business begins

to slip away so far as he personally is concerned, because your principal stock in trade is good will. The agent, unlike the merchant, has nothing on his shelves that the people need come to his shop to purchase. His business is usually built up by going out after it, so it behooves us all to build up a good reputation and guard that well as our greatest asset.

You are also to bear in mind that you are in the business for the purpose of making an honest living. As a well known medical practitioner and professor once told a young friend of mind who was studying medicine under his instruction. He addressed him thus: "Gus, my boy, I am an old man and have been long in the harness; take an old friend's advice. Always remember first and foremost you are a physician to make a living for yourself and family; do that and the higher rewards and the honor will come after." If we may accept this as the common attitude of the medical profession, it seems to me that we can safely apply this rule to the real estate profession.

The calling of the building manager is an honorable profession, and, moreover, it is growing in importance and distinction. This is indicated by the great and increasing number of real estate men engaged in the management business. The agent who works faithfully for his clients is held in high esteem by his patrons. He holds a confidential position towards his client not far removed from that of the attorney and counselor-at-law, and once his business is well established, his income is greater and generally more lucrative and constant, because his services are more continuous than that of either the attorney or the physician. The lawyer and doctor have to spend many years in study before they may seek a practice, and they often require years and years of patient waiting before they gain many clients. The field in business property management is constantly growing. It is practically a new branch of real estate business. The large modern buildings such as we may see around us today, where a large manufacturing business may be accommodated with tens of thousands of square feet of floor space on a single floor, were not dreamed of fifty years ago.

The field is growing; opportunities are opening every day for the agent who is equipped to take up the work, but he must show a determination and the intelligence to perform a work of real value to the owner. The landlord is only too glad to hand over the burden to the man able and willing to handle the management of his property, provided he may at the same time escape these burdens and cares. Trials and disappointments will come. Tenants will sometimes make complaints of the most trivial character. As a rule it is best to attend to complaints promptly, because delay often tends to make the complainants still more angry; a little extra attention will often act as "oil on the troubled waters." Often the manufacturing tenant will blame the agent for everything that may go wrong, even his own shortcomings and failures, but all these annoyances will soon pass away. It is a noticeable fact that few complaints are received when tenants are prosperous and times are good.

In dealing with tenants you should always endeavor to gain and keep their good will and confidence. Talk with them and show a neighborly interest in their business and success. Be always ready to perform any little acts of service. Try to make things as convenient for them as you can. Do a little more for them than is actually required, rather than less. By this means you will make them pleased to remain your tenants as well as boosters for you in getting other tenants into your buildings. A tenant

who is dissatisfied will leave you the first chance he gets and is liable to stir up trouble for you among your other tenants. For this reason, as I can state from experience, it is wise to go almost any length in reason to try to please your tenants. The agent who will invariably take this means will surely be a success in the management of property; he will be able to hold his property in his care and also find it a great help to him in securing other property to care for. He will be pleasing his tenants and at the same time do a great service to the owner, for whom he must work constantly and never forget that the owner pays the bills, and the owner's interest comes first always. An agent who is not always looking out for the owner's best interests is doing wrong; he is a traitor to his calling and should get out of the business at once, because he is false to every principle of honesty and will bring disrepute on the whole profession of real estate agents.

It will often happen that the agent is called upon to make extraordinary repairs, especially in property, which supplies power to the tenants through machinery plants in the buildings. In all such cases it is usually a safe plan, after all your estimates are in, and you have carefully made up your mind as to the best course to pursue, to lay the whole matter before the owner, giving him your reasons for making the expenditure and your recommendations of the bids you propose to accept. In this way you keep the owner informed as to what you are doing and how you propose spending his money, as well as his consent for incurring the bill.

Every business and profession has some drawback. There is no vocation or calling where all is sunshine and roses and the agent of business property is no exception. It takes strong courage, buoyant hope and lively faith to succeed. You must have hope and faith in the future and courage to go forward to meet and overcome all difficulties.



Proper Management of Buildings

By W. H. Class

I DOUBT if there is any building manager who would admit that he is not operating the property in his charge in an economical manner; and yet the fact remains that there are many buildings costing more to operate than is necessary. This is principally the case where the property is owned and operated by the owner himself. As an instance I would mention a building that had been operated by the owners themselves for about twelve years. They lately placed it in the hands of an experienced agent, and the first year under this agent's management showed a saving of 20 per cent in the cost of operation. This meant that they had been going on, year after year, believing that they were receiving the greatest net income, whereas, they were, each year, really throwing their stockholders' money away.

The greater number of properties under your supervision, the more economically each can be operated. The greater purchasing power due to the greater number of buildings, means lower prices for your supplies. This is also true to a lesser extent as regards repairs. To illustrate this I would mention a building that our office assumed charge of, where they had been paying a certain price for No. 1 buckwheat coal. On our appointment as agents we at once notified the coal company holding our contract (which in this case happened to be the same company then delivering coal to this building) that the building would, after a certain date, come under our contract. This alone resulted in a saving of almost \$1,000 per year, and was all due to being able to demand a low price per ton on account of the large annual consumption.

You must remember that the tenants in office buildings are business men, paying large rentals and demanding the best of service and attention. This is where the personality of the manager enters into the actual income on the property. A pleased and satisfied tenant usually means a longer occupancy of the office by that tenant. The manager must, therefore, be one who is a good judge of human nature and dispositions, and able to know, when entering a tenant's office, whether this is the man that he must slap on the back and say, "Hello, old fellow!" or whether he is the one that must be approached with a bow, and a pleasant "Good morning!" The slap on the back in the second case would probably result in the loss of that tenant, the tenant believing that there was a "fresh" man in charge of the building. The slap on the back in the first instance would stamp him as a good fellow. I only mention this to show that it is quite necessary to study your tenants.

Where there are a number of buildings under the charge of one person or firm, it is advisable that the manager refrain from entering too much into the small details. In my opinion it is a good plan to have one person in each building responsible to you for the condition of that building; you at all times keeping a firm grasp on what is going on.

The aim of your work is, of course, the largest net returns for the owner. These net returns are affected by things other than the actual cost

of operation; for instance, costly construction does not always mean increased rents; as an example of this I would mention a building costing \$1.25 per cubic foot to construct where it is impossible to maintain a greater average rental per square foot than in another building costing only 65 cents per cubic foot. This, you will see, gives the owner in the second case a greater net return on his property. It is my purpose to show that the cost of beautiful fancy carvings on the outside of a building cannot be collected from the tenant in rent. The ideal building is one that is substantially constructed, not gaudy, but rather plain, with an absence of fanciness in the way of oddly shaped windows and balconies from which you derive no rental whatever. It must always be borne in mind that you receive your rent for an actual number of square feet within four walls, and the fact that there are imported tiles lining the interior courts will not permit you to charge a greater rental.

It has become somewhat the practice, in recent years, for the architects of a projected office building to confer with the agent who is to operate the building, relative to the lay-out of the several offices, and to a certain extent as to the installation of the plant, especially as regards the number of elevators and also as regards all the small details in connection with the construction, with which the experienced office building manager is familiar. It must be remembered that the architect's and builder's duties end when the building is completed, and the building manager's duties commence where theirs end. The errors of any faulty construction or installation are visited upon the building manager. I have in mind a building where the architect, in order to make a fancy outside appearance, had the windows on two floors of the building so small that it was impossible for a person to see out of them without standing upon a chair. Now this was not due to any structural conditions which had to be overcome, but rather to make an imposing looking building from the outside. Now, can you imagine receiving as great a rental per square foot for these offices as you would have received if the windows were of a normal size? I therefore maintain that it is a wise owner of a projected office building that consults with an individual or firm who has had experience in this particular branch of the real estate business.

In operating your building it is essential, if you have not your offices upon the premises, that you visit it at least once a day, because it will be impossible for you to look after the interests of your clients properly if you do not know what is going on within the building. The employment of help in an office building is something that should be given careful consideration. Building employes must be of good appearance, courteous, and above all things must know that they are not to argue with tenants. There has been many a tenant lost from a building due to the apparent incivility on the part of an employe. When all is said, the building's reputation is made upon the service rendered.

The service rendered to a large extent is by the employes that are on the premises, and not by the manager, who comes in contact with the tenants infrequently. The employes should in all cases be uniformed, and the uniform should be kept in good condition. The usual employes of an office building consist of a superintendent or janitor—in some cases the superintendent also being the chief engineer—an elevator starter, elevator operators, porters, scrub women or cleaners, assistant engineers, firemen, engine-room helpers, and night watchmen. The duties of these different classes of help are too well known to make it necessary for me to mention. The superintendent

should be held responsible for the actions of the help under him. You should compel him to report to you daily as to all occurrences in the building, or any complaints that the tenants may have made. It is unfortunate that the class of people available for porters and scrub women is what it is, and the only thing that I can suggest in the cleaning department is, that you have your janitor keep after them all the time, and if they fail to perform their duties, get new ones.

The elevator service is a feature of the building which must be carefully looked after. If, when the tenant or visitor enters the ground floor there is a car waiting for him, in charge of a quiet, well uniformed operator, and if that car is in good condition and cleanly, that man gets a good impression. If, however, he enters the ground floor and has to wait some time for the elevator, his impression of the service of the building is very poor. So I therefore maintain that one of the first things that should be done is to see that your elevator service is as near perfection as possible. It is well to have a set of rules for your elevator operators, referring to the operation of the elevators, cautioning them as to the opening and closing of elevator gates, so as to reduce to a minimum the possibilities of accidents, and such other rules as the occupancy of the building necessitates. It is wise, no matter how you pay your help, by the week or month, to in all cases have printed upon your receipts the following: "It is understood that my employment is by the day." That will avoid any claim for a full week or full month's wages where the employe has been discharged during the week or month, as the case might be. The necessity for liability insurance covering your employes while working upon the premises is, as everybody knows, absolutely essential.

The purchasing of supplies for an office building is really a subject by itself. The purchasing agent must be a man who is not susceptible to flatteries or suggestions on the part of salesmen. He should refuse to receive any attentions, such as lunches, theater parties, etc., as, in my opinion, the man who accepts these things from the party with whom he is doing business is never in a position to find fault with that man. Everything that is submitted in the nature of supplies should be tested. This can invariably be done without any expense, as the dealers are always willing to furnish a trial order gratis. This testing should be done by someone in whom you have the greatest confidence and who cannot be approached by the dealer. In buying supplies it must be remembered that the cheapest article is not always the best article.

The selection of supplies should rather be governed by how much work can be done with the particular article and how much that work in the whole costs. This is not, however, true in all cases. I have found, for instance, that while soap powder at $3\frac{1}{2}$ cents per pound in the hands of the proper party will do more than twice the work of that costing $2\frac{3}{4}$ per pound, yet when these two soap powders are turned over to the scrub women they insist upon using as much of the higher price as they do of the lower price. It is almost impossible to prove to them that the same amount of work can be done with a less quantity of the higher priced powder. Of course, the volume of your purchases will, in a measure, control the cost of your purchase. The office that is able to purchase 50,000 tons of coal per year will necessarily be able to buy that coal at a less price per ton than the building purchasing only 5,000 tons per year. In the purchase of coal it is well to carefully look into the grades submitted. For instance, our office is now paying 10

cents more per ton for coal than the price submitted by another party for a different grade. We have found by experience that the grade we are now using is more economical at this 10 cents advance than other grades. It is wise to occasionally have your coal analyzed, as we find that the grade varies somewhat, and all the talk possible to the coal company, and all the complaints made to them that the coal is not good, does not necessarily bring better results; but, if, on the other hand, you are able to tell them that by analysis their coal is too low in heat units, or too high in percentage of ash, you have something really tangible to work on, or rather, which is better, take the business away from them for a while, and you will find, if you return to the same dealer, better coal will be sent you. It is better not to permit your engineer or janitor to purchase supplies. While it is not my intention to say that engineers and janitors are dishonest, I do not believe that it is well to place temptation in their path. Any janitor or engineer who receives a commission from a dealer is really taking that commission out of the pockets of the owner, as the dealer in every case will eventually get it from the owner in the higher prices which he will demand for his goods.

Repairs to a building should be, if not under your own supervision, in charge of a good practical man. As much work as possible should be done by the employes of the building. I find that it is economical in some of our properties to employ our own painters to do the work. At all times we can hire painters for less per day than the regular union rates. Buying paints in large quantities permits you to receive as low a price as a good many contracting painters. Part of the electrical work, such as repairs to wires, sockets, fans, etc., can be done by your own electrician. It is very seldom that you will have to employ outside help for your electrical work. Carpenter work, with the exception of the small jobbing, I believe can be done at lower cost by an outsider; in some buildings I have been able to place a man as porter, at the wages of \$10 or \$11 per week, who is what we call the "handy man," and is able to use a saw or plane, and, in fact, could do almost any small job that a carpenter would do. As long as we are able to retain these men we save considerable money.

In asking for bids on any repair work, you should be sure that the specifications for the work are perfectly clear, so that each bidder will understand it. If you are not familiar with the drawing of specifications, a good scheme would be to ask one man to figure on the work, being very explicit as to what he is to do, and then on the receipt of his proposition, you could copy his specifications, sending them out to others for bids. With work that is attended by any danger to life or limb, the order should not be given unless accompanied by a contract which is to be signed by the firm receiving the order for the work, in which they agree to indemnify the owners of the building and the agents, and holding them harmless against any and all claims, loss, damage or expense which they may sustain or incur by reason of personal injury caused to any employe or any other person during the execution of the work.

Special attention should be given to the jobbing work in a building, such as carpentry and plumbing repairs, because it is in this jobbing that the contractor is apt to make a larger profit than he is really entitled to. I am speaking principally of the many times when it is impossible for lack of time, or other reasons, to get a proposal at a certain figure, it being necessary to give the order for the work on a time and material basis. We have

found that this is the time when the contractor, or rather his men, are apt to "loaf" on the job.

There are, of course, a great many changes in partitions in an office building, the usual plan being to insist upon the tenant taking a sufficient term of lease to warrant the owner in expending the money incidental to these alterations. We have found it very convenient to do this work on a square foot price, the terra cotta or plaster block partitions being figured at so much per square foot, plaster finished on each side; door and window openings to be allowed for at one-half of their area; picture moulding, base and chair rail at so much per lineal foot; doors with and without transom above at so much per door. We also work under a schedule price per square foot with our painting. In measuring a room that has been painted, no allowance is made for windows or doors, the length of the room and height of the room being multiplied and the length and the breadth of the ceiling. With a view to doing work at a low price, painting is very often neglected, it being quite general to attempt to cover a formerly painted wall with one coat of paint. This I do not consider economical. It does not wash down as well, and the tenant is not as well pleased. I believe in always using four coats of oil and lead on a new wall, and two coats on an old wall. There are in the market many preparations that are mixed with cold water, and which are claimed by the manufacturers to do the work in one coat that any oil paint would do in two. We have experimented with these cold water paints, and have never found the economy claimed.

The economies in a building are really the key-note to profits. A large rent roll avails little if the expenses on the building are high. When I speak of economy I do not mean the false economy where a repair is made quickly and temporarily, but rather the economy that comes from the expenditure of a possibly large sum of money, knowing that the return on that expenditure will be large. In this connection I might mention the introduction in the last few years of the new high efficiency lamps that have done so much to reduce the coal consumption in the buildings. We have never hesitated to spend large sums for the installation of Tungsten or Tantalum lamps, knowing that within a short time our money would be returned to us. I have in mind one of our properties that expended some \$2,000 in this change of electrical installation, which \$2,000 was saved on the coal pile in eight months. In another building the expenditure of about \$1,500 resulted in the saving in one year of over \$7,000 in coal.

The portion of the building that should be watched very carefully is the engine room. Your experience must teach you when it is economical to change the grate bars in the boilers to use a smaller size coal, thereby saving money; and also whether it would be economical, which we have proved in more than one case, to place some artificial draft system on the boilers. It is unfortunate that in many downtown office buildings the chimney draft is very poor, thereby requiring a greater amount of coal for the maintenance of a certain steam pressure, and at the same time reducing the capacity of your plant. Within the past year I have had installed in one of our buildings a system of artificial draft which has made it possible to burn in this building number two Buckwheat coal in place of number one, as formerly, and without burning any greater quantity. As there is a difference, under our contract, of about 50 cents per ton, you can readily see that in this building, which was consuming close to 14 tons of coal per day, the saving was considerable. If in your office there is not a mechanical engineer or a prac-

tical man, familiar with engine room work, it is well to connect yourself with some good concern who can make examinations and give advice on the condition of the engine room plant. I have found that while the greater number of engineers in office buildings are good, practical men, they have not the theoretical knowledge which at times is necessary for the good of the plant.

In connection with this I might mention an engineer who has been for some time in our employ, and who stated that it was absolutely impossible to burn in his building any smaller size coal than pea. We insisted upon him trying No. 1 buckwheat. This was about one year ago. He is still using No. 1 buckwheat, and the saving to the building has amounted to about \$2,500. Now the trouble with this man was, that while he had the interest of the building at heart, he never had tried the No. 1 buckwheat, and was afraid to try it fearing that it would be necessary to shut his plant down. To avoid this contingency we had on hand pea coal that could be immediately fired into the boiler; but we, of course, have not found it necessary to revert to this size. By all means see that all of your engine room equipment, which, of course, includes your elevators, is kept in the best of repair. You will find that in the long run you will save money. The longer you neglect a repair on an engine, a pump or an elevator the more that repair will cost when you are forced to make it.

There have been a great many discussions and articles written regarding the relative merits of the isolated plant as against the Edison service. It is not my purpose to go into any argument as to the merits of either. I might state that we have properties where we believe it economical to operate with the Edison service and the New York Steam Company's steam. Other properties, which are in the majority, we find it more economical to operate with our own plant. I believe that this is a subject that can be talked of forever. Circumstances govern each case.

The building manager should be well acquainted with the tenants of the building. He should make it his business to occasionally visit the offices. These visits will tend to give the tenant the idea that the owner is putting himself out to please him. Each tenant should be impressed with the idea that it is the intention of the building manager to do all in his power to make it comfortable for the tenant. Complaints should be given careful consideration and the trouble should be promptly corrected. Of course there are many complaints made by the tenants, which are unjust and unfair, and there are also many requests made by the tenants which are unreasonable. In declining to do anything for the tenant it should be done in such a manner that the tenant will not feel that he is being neglected, or that the landlord is in any way arbitrary. Of course, this would depend largely upon the tact and diplomacy of the building manager. It is not a bad scheme to occasionally suggest to a tenant that his office requires painting. He will be sure to tell some one of this, saying that he has a landlord who does not wait to have his tenants request that their offices be painted, but rather walks in and suggests it himself. I do not mean to convey that it is well to go through a building with this form of proposition, but it is good to use it in certain cases where you believe that the building will eventually benefit from it.

It was not my purpose to touch upon the collection of rents, but there is one thing which I feel I must mention. The office occupied by the tenant who is in arrears must be lighted and cared for the same as other offices in

the building where the tenants promptly pay their rent. The cost is just as much for the operation and care of the office of the poor-paying tenant as it is for the good-paying tenant, so I therefore contend that a vacant office is a much better proposition for the landlord than one occupied by the slow payer. One thing necessary to the first-class management of an office building is that the offices shall be kept thoroughly clean. I have found that the greater number of complaints from the tenants in an office building refer to the cleaning of their offices. As I have mentioned, the class of help doing this cleaning is not of the best. It seems almost impossible to engage first-class cleaners.

We have lately installed in several of our buildings portable vacuum cleaners, which we for a better name have called "kick regulators." These vacuum cleaners are not for general or daily use in the offices, but are rather used in individual cases where the tenant makes a complaint to the janitor that his office is dirty. If the vacuum cleaner is at once put in the office and the office is thoroughly cleaned, the tenant is a pleased tenant.

In connection with the operation of office buildings some system of records is absolutely necessary. Without records showing a comparison of consumption of coal and other supplies, it is impossible, almost, to know that the building is being operated for the best interests of the owner. I believe that the best method is to have your engineers make a weekly report, showing the daily consumption of coal, oil and electric current, together with the amount of ashes removed from the building.

I also believe in keeping a record of the cleaning cost, having the janitors of the building make a daily return of the goods received. When these same style goods are again ordered, you will at once be able to tell how long the former lot has lasted. For the purpose of computing the operating expenses on new properties you will find that a complete set of records will be very valuable, as the cost of operation per square foot of rental space in the different buildings in New York should vary but slightly.



PART II



Renting

The Elements of a Renting Policy

By Earle Shultz

TO keep and to get tenants; that's the problem. "To keep" takes precedence of "to get," because those qualities which are powerless to hold old tenants will never be able to attract new ones. Business men move, not for the love of moving, but to secure office homes in which they can remain indefinitely with pride and comfort. Of what is there in an office building for such men to be proud? Its reputation. And what therein contributes to their comfort? Its service.

Reputation and service. These two words should form for every building manager the nucleus of his policy. To those buildings which shed a distinction upon their inhabitants are tenants drawn most strongly. Let it be generally known that only reputable people are admitted into a building and to all its occupants is lent the color of reliability. For this power of a building to establish confidence in its inhabitants, superior and permanent tenants are desirous and willing to pay, and to pay well.

But reputation must be backed up by efficiency of service. To its tenants and their customers a building owes all the aid it can logically render. The offices should be adapted to the business to be carried on therein; they must be kept scrupulously clean; and the wants arising from their use be taken care of promptly and effectively.

Into offices tenants usually cannot be forced. The question of moving arises at infrequent intervals. At these times their aroused interest is known only to their friends. A good word from the ones who office with you will have more "pulling power" than any full-page advertisement. His friends a man knows and believes. Not only has he admired their offices in your building, but the smoothness and courteousness of your service to the general public has been appreciated by him. There lies dormant in some fold of his mind the idea that he would like to be in your building. And when the opportunity offers he presents himself at your renting counter.

The great disadvantage of an aggressive solicitation of tenants is that where you appear anxious to rent your space, they force you to bait them with costly concessions in price, or else assume unexpired leases. If you need tenants that badly, all right. If not, allow your building to pull as much as possible for itself.

Concessions, if made, should not be in rates, but in time. If the rate is cut there is a loss not only during the term of the lease, but on renewing it will be found next to impossible to bring the rate back to the normal. The justice of an increase is never seen by the tenant, and if insisted upon he either moves or holds a grudge against you. A better way is to compute the total amount of the cut in months of rent and give that many free, with the normal rental after that period. In this way you pay no more for the lease, while on its expiration a normal renewal rate has become established. However, there is little wisdom in making concessions under any circumstances.

Tenants should be allowed to do their own renting. That is, the renting

man should not push them into an office by force of hypnotic salesmanship. A traveling salesman can use that method and then leave town. But your tenant you have with you until his lease is up. If he should come to feel that he has "had one put over on him" he will be anything but a comfort and an asset to that building.

To assist the prospective tenant in his search for an office is the duty of the renting man. He should see that the applicant gets a clear understanding of the space shown him, both from the renting plan and from the premises themselves. All the conditions of the tenancy, such as term of lease, services charged for, etc., should be explained. A wrong impression as to space should never be given. If the light is secondary, say so; and state further that the price has been scaled down to meet the condition. There are men looking for that very arrangement. If the one before you is not, he would never be satisfied there.

The most effective "trick" of renting salesmanship lies in showing the prospect how advantageously the space under consideration adapts itself to his use. When he objects to a suite because he cannot do so and so in it, the renting man must at once point out the methods of accomplishing that very thing. Once convinced that an office completely fulfills his requirements the looker becomes a tenant.

The zenith of efficiency in space-selling is reached when an applicant has been convinced that either the present division of the space, or such a division as you are willing to make, is much superior to any other possible arrangement. One tenant may wish his private offices but nine feet in depth; while the next will insist upon their being eleven. Now as a matter of fact a ten-foot office will do perfectly for each of them if they are shown how the foot more or less neither adds to nor detracts from the usefulness of the room. Many of a tenant's ideas of alteration are mere notions, and often they would be a positive disadvantage to himself if carried out. In other words, the renting man has, in a systematic and rigid standardization of alterations, his greatest opportunity of effecting a considerable saving in operating expenses.

Beside the acceptance of tenants there is no point in the management of a building which is so vital or which requires the exercise of such good judgment. Good tenants may be secured along with the bad while a building is new and has not as yet acquired a character; but as soon as get-rich-quick advertising goes out and it becomes known that the building houses questionable concerns, the desirable tenants will leave and rents will fall off with their going.

In passing upon an application the building manager must take a point of view different from that taken by a commercial credit man or a bank. It is the applicant's personal and business, rather than his financial, reputation which is of prime importance. Naturally the building must have its rent, but if the applicant is worthy—say a reputable young attorney just starting out for himself—the building is often justified in "going into partnership with the tenant" so far as the rent is concerned.

The best of all sources of information are the credit agencies, particularly those that make a specialty of watching questionable concerns. The next best is the bank reference, which is of course good as to a firm's finances. Poorest of all are personal references, unless the persons referred to are known and reputable individuals.

The length of lease a building may require must be governed to a great

extent by local conditions. Leases of three to five years, however, are, where possible, most satisfactory. For a minimum length of term several factors favor three years. A great deal of rearrangement and alterations in an office is usually demanded by those tenants who can pay good rentals; and such changes a building cannot afford to make for anything less than a three-year lease. Conversely, tenants who refuse to take a long term lease are not as a rule the best of tenants. The three-year lease thus has a selective effect.

To a large building that had only one-year leases the renewing of its entire rent roll would be an annual burden of considerable size. Furthermore, it would be impossible to re-rent at once from the date of expiration all space given up. Some of it is sure to stand idle for a time.

The largest benefit of three-year leases, some of which expire each year, is the permanency which they give to the rent roll. For instance: during the panic of 1907 a large number of tenants, frightened by the financial depression, wished to take smaller quarters. Learning they could not get off their long-term leases, they settled down to make the best of it, with the result that before their leases had expired the crisis had passed and they found themselves needing all their space. No risk is run by the manager of having his building full one year and half-empty the next. Nor will the manager of a new building, finding your tenants footloose, be able to pull a great number of them into his quarters.

Unless the growth and development of his concern is absolutely limited no business man is prophet enough to know what he will need in offices five years hence. His company may want more, it may need less, or it might decide "to move its headquarters to another city." Even if they still use the same amount of space, changes in their methods may demand a different kind of space and so a move. It is just the large concerns that want long leases because of their size, that are the most subject to these changes. The result is that not more than two out of five long term leases are ever lived out. Then why make them? They are no safeguard against a large concern moving out, and the chances are that when they do leave, they will find some way to make you go to the trouble of re-renting the space for them, instead of for yourself. Or they will secure the new tenant, if you do not, and, in a majority of cases it will be some one whom you do not care to have in the building; for the big concern is interested only in getting the lease off its hands.

Whether all leases should expire on one date or at the end of any month must also be determined largely by local conditions. If the majority of leases in a city expire on, say, April 30th, that building manager whose leases expire irregularly will find himself without applicants for offices vacated during the dull renting season. The one date expiration system often serves to make space more available. If a building is practically filled it is difficult to take care of growing tenants except at the expiration period when they can be given first choice of the space coming vacant. Then, too, adjoining offices can be consolidated to take care of large applicants who could not otherwise be received.

In drawing leases it is well to keep them as simple and as free from special clauses as possible. It is the surest way of avoiding legal tangles.

All alterations to be made in offices should be explicitly understood by both parties at the time of the signing of the lease. A simple method of insuring this is as follows: Draw a tracing of the offices showing in black

lines all of the old work that is to remain; in dotted black all that is to be removed; and in red all new work. If any irregularities are to be permitted they should be noted on the tracing. If the tenant is to pay for any part of the work this fact also should be stated, together with the basis on which the charge is to be made. The tracing can then be O. K'd by both parties and made a part of the lease by the insertion in that document of the following clause: "The lessor agrees to divide the premises as per plan signed by the respective parties thereto." From the tracing can be made blue-prints to serve as working plans for the construction gangs.

The renting office of the building should be well located in light space and easily accessible from all points of the building. The first stop of the express elevator is a good floor. To stick the office of the building away in some dark corner is a mistake. If this office is gloomy and unpleasant it creates in the mind of the prospective tenant a bad impression against which the renting man will have to fight.

The renting equipment should be as simple and self-explanatory as possible. A set of plans and a descriptive booklet with a typical floor plan on which to sketch offices shown, are about all that is necessary. A practical method of handling the renting plans is as follows: From a tracing of each floor, on which is shown the exact arrangement of the offices and the names of their tenants, black-line prints can be made, which, when mounted on cloth, may be assembled in a loose-leaf style of binder. The advantage of the black-line print is that the lines on it can be erased by a fluid and any changes made on a floor drawn in in black India ink. As the paper is very tough, even this ink can be erased, so that the plans will last for a number of years. Indicate the vacant offices by a pencil cross over the space with a notation of the price of the suite.

The booklet, to be of real value both as a souvenir and as an advertisement, should consist mostly of pictures with the reading confined to answering the general questions usually asked by an applicant at the renting counter. Only one floor plan for each different typical floor arrangement will be necessary in the booklet.

It is a good plan to have all vacant rooms on one key. With locks of the cylinder type this is easily accomplished by having in stock a number of identical cylinders, one of which may be exchanged for the regular lock whenever a room becomes vacant. This saves the renting man a lot of labor and annoyance as he can always have one of the "vacant" keys with him.

The most satisfactory method of handling a tenant who wishes to give up his space is simply to tell him that you will do what you can to re-rent his office for him. Then put it on the renting list and dispose of it as soon as possible. In this way you not only get a strong and satisfied tenant in place of a weak and uneasy one, but you extend the period for which the space is rented. You are also able to select the incoming tenant with great freedom. Of course alterations required by the new tenant must be paid for by the old, and in this the building further gains.

And right here is the very best of all chances to raise your rent rate. Unless the old tenant is on the point of bankruptcy, always ask a little more for the space than he is paying. You are in no special hurry to dispose of it, so that you can afford to wait for the customer who is willing to pay the new price. In one building this method alone increased the rent roll 7 per cent in three years.

Perhaps the most ungracious task a manager can be put up against is that of asking one tenant to move for the benefit of another. And it is a problem for the solution of which the building pays more than enough. If possible make the tenants negotiate with each other, the building only coming in to show the displaced one new space.

Often tenants desiring additional alterations before the end of their lease will offer to renew for an additional three-year term in payment therefor. In such a deal the tenant is getting the best of it if he still has more than a year to run on his original lease.

Sub-tenants are the bane of a manager's existence because they are the hardest to manage. In addition to refusing to countenance sub-letting it is a good plan to secure the services of a clipping bureau and in this way keep a line on all advertising going out from the building. If any objectionable ones turn up—most of which will be from sub-tenants—insist upon having them stopped or modified, or even take steps to eject the undesirable parties.

A great many devices in the way of automatic renewal clauses have been inserted into leases in the attempt to trap the tenant into keeping his office. These are all bad. Any tenant who wishes to leave should be allowed to depart in peace at the first opportunity. If he is held he will turn your profits on his lease into deficits through his negative advertising of the building. Then, too, such clauses are of doubtful strength and are likely to lead a building into costly litigation. It is much simpler, safer, and in the long run, easier to have the tenant execute a new lease for the additional period.

A renewal for less than three years is open to the same objection as a lease for a short term. Particularly applicable are the arguments as to difficulty of handling year leases, chances of loss on final expirations, the non-permanent feature, and the inability of making alterations. All the conditions of the maximum limit also obtain in the renewal.

Some buildings refuse to make any alterations on renewals. As a general rule, however, if a building can afford to make alterations on a three-year lease for a new tenant, it can well afford to do so for an old one. And, too, not nearly so many old tenants will require changes as would new ones.

An option of renewal is of value to the tenant only. It ties up the space and the tenant has a hold on his habitation of the building no matter how undesirable he may have become. Nor does it guarantee an occupant for the space.

Unless there has been some decided boom in rents, or unless a tenant's rate is much below the average, it is a dangerous proceeding to attempt to raise rents on renewals. Old tenants always feel that their term of rent paying entitles them to consideration rather than to extra charges.

In brief, a building manager's policy should be composed of those elements that will establish and maintain its reputation; that will solidify and make permanent its rent roll; and that will safely increase its receipts and wisely reduce its expenditures.



Filling an Office Building with Tenants

By Alfred Higbie

FROM the time excavation is started, and even from the time the report is first circulated that an office building will be erected, on a certain lot, in a good location, inquiries will begin to come in for space in the new building. These inquiries should be carefully filed and kept in alphabetical order so they can be referred to at a moment's notice. They should be followed up carefully, persistently and tactfully, until the prospective tenant either signs a lease, gives a good and sufficient reason why he is not willing to do so, or you can see by his attitude that he does not care to continue negotiations any further. In the latter case, drop him at once and let him entirely alone. It's a good gamble, however, that he will come to see you when his lease expires.

I am assuming that the building is now completed and ready for occupancy. If this is true and the manager has been on the job watching things as he should have done, and looking for prospective tenants, making leases, etc., he has been a very busy individual.

If the inquiries received for offices in the new building have been properly nursed and the building is in the best location, at least one-half of the entire building will have been rented by the time it is ready for occupancy. When the building is fully completed and ready for occupancy and tenants are moving in at the rate of two or three per day (as they will for the first month or two) it is an extremely busy time for the man in charge. He will be wanted in half a dozen different places and on as many different floors at one and the same time. He will be wanted for this, that and the other thing, and to all the inquiries or complaints he must have a ready smile and give acceptable assurance that the matter in question will be adjusted without delay.

This particular time is a critical period in the history of the building, when it will commence to make a reputation for itself, to prove or disapprove the manager's statement, that he will give the best service of any building in town. Right now is the time when a broad-minded policy must be adopted and pursued if the manager expects to get and retain the good will of his tenants, as only by retaining their good will can he hope to make the building a success. If he loses the confidence and respect of his tenants he will lose the tenants at the expiration of their leases.

Newspaper advertising in the local papers will produce good results. Classified advertising will do very little good. Plenty of space should be used, and the less reading matter you can use to bring out the most important points the more attention it will create and the better results will be accomplished. Some one convenience or special feature about the building, or its equipment, must be displayed, or brought out in such a catchy manner that it will not only attract the eye, but hold it until the entire advertisement has been absorbed.

If the building is located in a city or state which is the home of some great industry, get up a special letter and send to every large concern in

the United States which is directly or indirectly connected with the handling or disposition of the product of that industry.

A nicely gotten up, short, clean-cut letter, sent out to tenants in other buildings, and who possibly have no thoughts of moving, will very frequently bring good results. From five to ten replies will be received out of every hundred letters sent out. These replies will come by letter, telephone, and some by personal calls. It is a good policy to follow up those letters from which no replies are received, with a personal call. Your letter will have brought the matter to their attention and as soon as you introduce yourself to a man who has received your letter, he will know where you are from and what your business is.

I have used several letters, but the following is a copy of the letter which has brought the best results:

"Are you willing to improve the location of your offices, improve the tone of your offices, improve your general surroundings if it doesn't cost you any more money?

(The above paragraph appears in red.)

"My Dear Sir:—That is the proposition in a nutshell. Are you interested?

"The Blank Building is undeniably the finest modern fireproof office structure in the city. It is located opposite the Smith Building and in the heart of the business district.

"The offices—all outside rooms; the elevator and janitor service—kept to the highest degree of efficiency, combine to make your tenancy both pleasant and profitable.

"Let me talk this matter over with you. I can make you a proposition that will surely be of interest.

"My phone is

"Very truly yours,

"Rental Agent."

You must not expect your letters to do the work for you. The most they can do is to introduce the subject by calling attention to the building and its equipment. The manager must follow these letters and do the actual work. There are several methods of giving publicity or securing tenants for a new building, but none that will produce the same results as personal solicitation. Careful, persistent soliciting will eventually overcome any prejudice or objection in the mind of the prospective tenant. When this is done and the man's confidence is secured, the rest is simply a matter of form until you have his name to a lease and he is comfortably located in the new building.

While making the canvass, the manager should refrain, religiously, from making any misstatements. He is not only making a bid for patronage, but establishing a reputation for himself as well as for the building he represents, both of which he must have in order to make the greatest success.

Good service in every department is a very essential feature and should be made the first consideration. Good service will do more to hold your tenants and induce others to come in than any other one thing in connection with the management of the building.

The best class of tenants help very much in establishing the standing and reputation of a building, as also does the first-class building help to establish and maintain the standing of its tenants. Be particular in selecting

the first tenants. If the best class of tenants are secured on the start they will help draw other good tenants to the building with very little effort on the part of the manager.

If the office space proper is finished without any partitions and the tenant's needs are measured in square feet instead of so many offices, be extremely careful about the arrangement of the partitions which the tenant will want installed. Do not permit him, on account of some peculiar idea he may have, to place the partitions in such a manner that they will have to be rearranged before the office can be rented to another tenant, but by studying his business carefully an experienced manager can frequently show this tenant an arrangement that will not only serve his purpose to better advantage, but which will conform more closely to the general office arrangement, and which it will be unnecessary to change when the next tenant moves in.

Carry your pockets full of floor plans and prospectuses of your building. Sleep and eat on the job and you will become so enthusiastic over it that every word you breathe in connection with the new building will carry conviction with it.

If your building is rightly located, rightly planned, and a broad, clean-cut policy is adopted, there will be slight cause for advertising or soliciting as there are plenty of representative firms who can easily be induced to move if they can be shown a more advantageous location, or secure a better arrangement of their offices.



Determining a Rental Rate

By F. H. Heywood

I DO not know by what rule or method other managers have gone about the work of "rate making." In point of fact, I have never heard of any rule; and perhaps I am mistaken in thinking that a rule may be made to fit all cases, but I have a method which to me seems logical and which I have had the satisfaction of seeing worked out successfully, and so I give it here for whatever it is worth:

First, I reach my final conclusion in the very beginning, doing the problem backwards, as it were. I determine the total net income per annum which the building should yield to its owner from his investment, including interest while building, and I do this by consultation with the owner and by careful consideration of the city and its environments and the location and character of the building, as well as the prevailing rates of net income from investments in other property equally as staple and secure.

Then I add to the net earnings or income, as determined above, every possible item of expense, every possible item of service which it has been determined to give, the cost of operating, the repairs, the changes to suit tenants, insurance, taxes, replacement of machinery and equipment, to all of which I add 10 per cent, and in some cases more, to take care of fluctuations in prices.

(Note:—The estimating, before a building is completed, just what will be the total expense of operating it, is by no means an easy task, but while you are cautioned not to use other managers' figures generally, since they are not likely to apply with mathematical accuracy in your case, yet you may obtain much helpful information from them and from the reports and papers upon these subjects presented at the National Convention of Office Building Managers and published in the magazine, *Building Management*.)

From the total sum thus obtained by adding net earnings to total expense, I deduct the rental which I know I can get for the first or ground floor. This is usually pretty well settled in each city. I, of course, make due allowance here for possible vacancy and difference, if any, in the service.

The basement may here also be considered, but this may prove to be a more difficult problem, and in some cases is wholly omitted from consideration.

Allow 10 per cent of the total rentable area above the first floor for vacancy and possible loss of rents, in some peculiar cases more. This is simply a precaution for safety, and most building managers are able to show much better results than this might seem to indicate.

Divide the resulting remainder by the total rentable area above the first floor in square feet.

Multiply the result by the number of square feet in each room.

The result will give you the average annual rental value of each unit or room if each were all equally desirable. Reduce this to a monthly rental price in round figures.

Then proceed to add to the choice locations and more desirable units or

rooms and deduct from the less desirable rooms. Here is where you must use every possible care to balance your ship, lest one or the other side become overloaded.

The several items which go to justify differences in rates in different parts of the same building may be set down as follows:

1st. The advantage of advertising upon the windows commanding a view of the principal street or streets. Though this is different in different cities and in different locations within the same city, yet instances may be noted where a corner room with windows facing two prominent streets and upon the second floor will rent for forty per cent more money than the same sized room at the same corner upon the sixth floor, and 130 per cent more than the average of the building, 300 per cent more than the low rate in the building, seventeen per cent more than the same room on the third floor and twenty-five per cent more than the same room on the fourth floor. Again this room commands seventeen per cent more than the one adjoining it upon the principal street and twenty-five per cent more than the room adjoining it upon the side street. The manager of the building under consideration tells me he has no trouble in getting from fifty to 100 per cent more rent for rooms which offer advantages for advertising the tenant's business, either by having windows facing principal streets or entrance doors facing the elevators.

2d. Units or rooms with entrance convenient to elevators, or with the entrance directly facing the length of the corridor, in some buildings have an added value.

3d. View and quiet.—The upper floor units nearly always command a higher rental, in some instances as much higher than the middle floor, as the advantages of advertising on the second and third floor is higher than the middle floor. There is everywhere a class of tenants willing to pay for the view obtained from their office windows and for the quiet obtained by height above the noisy streets.

4th. Natural light.—In the west particular attention has been given to an effort to obtain natural light to each unit and, as a result, large areas have been devoted to light courts. Whether or not this pays is difficult to determine. I have at times been inclined to doubt it. You can nearly always find some tenants who are easily satisfied with artificial light if they can get a lower rental rate, and if you make your own current you can afford to simply figure fuel cost, when comparing extra cost of lighting these dark rooms, with what you can get for them. Of course, additional cost of construction and service must also be figured. But take a room on a light court with the view obstructed, as it must be, and very little, if any, natural light. At the bottom of the shaft you can get practically no more rent for it, because it has windows opening upon the court, than you could if it simply had good ventilation which can be had without the windows, and you have lost the space upon valuable ground for many floors in a court which might be yielding an additional income. The rental rate procurable from office space facing light has its effect upon rates of the new building. The owner, who is a good business man and who is building for revenue, will not overbuild your city with office buildings. The margin of profit is too narrow for him to take the chance, unless he is pretty certain there is a demand for office space beyond the present and prospective supply in your city.

Competition may be made the life of rates and it's up to you to simply

turn it in the right direction. Competition advertises, competition makes new customers, makes the man with his office over the corner grocery look for better space and better service. Competition makes your job, makes it interesting and worth while, makes you a necessity. Be ready with all the arts of your best salesmanship to land the new customer. Competition is healthy for you and your employer as well, so fear it not.

What is there about the size of the unit which may affect rates? Perhaps we should explain—the unit is understood to mean the smallest rentable area into which the building is divided. In some buildings this is “one room,” in others the unit may consist of two or three rooms with only one entrance from the corridor. Hence it cannot very well be rented to separate and distinct tenants, but must be rented as a whole.

Though dependent somewhat upon the class of tenants and their requirements, yet I think it is almost an invariable rule—the rate per square foot varies inversely with the size of the unit. And why is this, do you ask? It is because the man is an exception who will pay for more than he needs. His requirements are “just one small room,” but he wants that to be first-class and is willing to pay a good price for it. He goes to you and you offer him the smallest room you have, which is 15x24, 360 square feet, \$30.00 per month, or \$1.00 per square foot. He comes to me and I offer him a room 10x12, 120 square feet, \$20.00 per month, \$2.00 per square feet. He takes my room because it meets his requirements and saves him \$10.00 per month, though he pays me twice as much per square foot as he would have to pay you. If he wants two rooms, I still have you beaten, for I can offer two rooms as above, more symmetrical in size, each with a window to the street and each with an entrance to the corridor, and if I am so reckless as to cut my price per month to meet yours, I will still be getting \$1.50 per square foot, where you are only getting \$1.00 per square foot. You cannot divide your space to compare with mine, for you must sacrifice at least one of the three attributes which I retain; you must sacrifice either symmetry or one window facing the street or entrance direct from the corridor, or natural light. But if there are two men who wish to become joint tenants of a unit, you can make a three-room suite of your unit at half my regular price per month. But if I meet your price per month I will be getting just as much per square foot as you. And on the other hand, while I may have to make some reduction if I wish to secure this tenant, I shall not have to meet your price, for three of my rooms will each be more symmetrical, each have windows upon the street, and each have direct entrance from the corridor.

The above, of course, fit only the conditions and requirements there considered, and the rule in such cases certainly applies.

The number of rooms per unit has its effect upon rates—though many single tenants are satisfied with one room, perhaps more of them like two, a private office and a reception room. If your space is divided into units of two rooms, and mine into units of one room each, your monthly rental for a two-room suite will be less than mine and your square foot rate will also be less than mine. But if I offer the prospective tenant two rooms at my regular monthly rental, which is higher than yours, I shall be able to give better light and better view to each room, as well as two entrances to the corridor. My arrangement is better than yours. I ask more money, in most cases I get more. And nearly always make a better profit for the owner.

And this leads us to say to the owner and architect—if you wish to keep your building full and make it most profitable, arrange the space so we shall have a variety of goods upon our shelves to meet the requirements of, and sell to all first-class tenants, who may apply or be sought for by your manager salesmen.

There is a thing which we have not yet considered which also has its effect upon rates. Its tendency is neither to raise nor to lower them, but rather to bring the extremes toward each other. It becomes the great leveler of rates. It is the wide diversity in the requirements of tenants,—the varied and multifarious tastes of the many different species of the race of men who rent office space. Perhaps in some cases it may be called the idiosyncracies of tenants. One wants north light, as it is best for the eyes and less fluctuating. Another desires south exposure, because he enjoys the sunlight. Another wants a view of the city and its streets. And another wants to be high enough to view the entire landscape, to see the green fields and running brooks, to broaden his horizon. Still another objects to views because they distract his attention and the attention of his employes from their work. For the same reason some prefer the room on the court. Some seek the quiet and will take a dark room to get it. Another will stand for the noise and give up the view and accept the roar of traffic if he can but get a location where he may attract the eye of the public to the signs upon his windows. And so the many different requirements, tastes and idiosyncracies of tenants affect the rates, but the influence thereon is a salutary and a happy one for the manager and the owner, because he is pretty sure to be able to meet most of them, and what may at first have seemed an undesirable unit, fit only for storage, may later prove to be just what some man wants and is willing to pay a good price for.

And above and around and through all these questions which affect rates, after you have considered and digested and figured on all that it costs to operate, and every expense of service, of keeping your building in a tenantable condition, of repairs, renewals and alterations and all the other items of expense without number, you come to the many different interpretations of the phrase "fair dividends." This is the crowning item of all the many things which affect rates and depends entirely upon the individual landlord or owner. One owner will be satisfied with a net return of three per cent, another with five per cent, another wants seven per cent, still another thinks his money should earn him ten or twelve per cent.

Service—By this we mean all that is furnished without extra charge over the stated rental rate. It differs slightly in each building; practically all furnish heat and janitor service; most buildings include artificial light; many add to these towels and soap to each unit, electricity for fans, vacuum cleaning, polishing furniture and cuspidors, portable desk lamps, ice water and messenger service. The quantity, kind and quality of the service very materially affects the rates. And in the same breath, I say it affects the net income. For I believe it is a fact in every building in the country, the tenant is not charged with his full proportionate share of the actual cost to owner for the service given, in our modern office building. And yet service is the talking point, service is the tenant getter. Quick, prompt, proper, efficient and thorough service makes the building. And why should not tenants pay for service? Include it in the rental rate if you wish, but make

them pay for it as much as it would cost them if you did not furnish it, or in any event, as much as it costs you. I believe they would if you took them into your confidence and let them know what it costs. There is too much secretiveness about the business side of most office buildings. Most of your tenants think because you are charging them a high rate that your profits are larger than you are entitled to. If they only knew the narrow margin upon which you operate, their demands would not be nearly so exacting and excessive. The busy business or professional man who is your tenant will gladly pay you all the service costs you if you charge it in the rent, rather than be annoyed by the numerous small bills and the vexation of purchasing the same service from a number of sources.

Then there is the wasteful tenant, who abuses the privilege and the service because he thinks he wants to get all he can for his money. Now who is he robbing? Not you, if you have remembered him and figure the cost of service high enough. He is robbing himself and his fellow tenants, but he is making you perform an injustice; he is making you charge your careful tenant for what your greedy, careless or robber tenant wastes. Perhaps, however, every item of service can be properly charged in the rental rate with no great injustice to any tenant with the single exception of artificial light. Among the questions I sent to Building Managers in various cities was—Should electric light be metered to each unit and charged for extra over rent? Nearly every reply was "Yes." Among the replies was the following, which is so very pertinent here, I shall give it in full:

"Replying to your question, 'Should electric light be metered to each unit and charged for extra over rent?' we answer very positively, yes, and perhaps our experience as follows may be interesting:

"A few years ago we were appointed managers of a certain office building, containing also several store rooms used for mercantile purposes and a theater. We found that the rentals were all based upon the lessor furnishing water, heat and light. Upon analyzing the year's business just prior to our appointment, we found that the coal bill amounted to \$5,600, which, from our experience, we immediately knew to be excessive. We therefore, invested in a few electric light meters of varying capacity and, unknown to the various tenants, applied the same, so as to measure the current used by each. After one month's use thereof we found the following startling facts:

"A druggist, whose monthly rental was \$125, was using current which, if bought from the Commercial Lighting Company, would cost him \$148.

"Another tenant on the first floor of the building whose monthly rent was \$150, was using \$128 worth of current, if bought commercially.

"A lawyer who occupied a suite of three rooms, was using current which, commercially, would cost him \$28, whereas the rental paid for the rooms was only \$42.

"Several offices with a single occupant, whose rentals were \$15 each per month, were using current at the rate of \$3 to \$5 per month, if purchased commercially.

"These figures convinced us that the system was entirely wrong. Whereupon all tenants were notified that with the expiration of the leases then in force, they would be expected to pay for current used separately. We thereupon installed meters for all tenants, at an expenditure of approximately \$2,200. After one year's trial of this new method we reduced the

coal bill to \$3,500 and received for current used from all the tenants the sum of \$3,200.

"The druggist had reduced his average monthly bill to \$29. The lawyer above referred to had reduced his average monthly bill to \$6.00. Another first floor tenant had reduced his average monthly bill to \$32.00.

Thus it will be seen that the former method was very wasteful, and that the current was used without any thought on the part of the tenants. We have persisted in using this system in all buildings for which we are agents without complaint on the part of any of the tenants.

"The average American citizen is always willing to pay for what he gets, and on the other hand is thoughtless enough to ride a free horse to death. The collection of the light bills has added no material expense to the cost of conducting the business. The chief engineer reads the meters and keeps the electrical fixtures in order. We charge the tenants at the same rate that the Commerical Lighting Company is willing to furnish the current for, which in our city now is a maximum of 8 cents per kilowatt. We furnish some of our tenants as low as 5 cents per kilowatt. The arrangement now in force is that when a tenant moves in we furnish him with new electric light bulbs throughout for each fixture in his office or place of business. When they need replacing he does it at his own expense. The figures above should be conclusive as to the non-desirability of furnishing tenants with current for whatever purpose without measurement and without a fixed price."

I believe it is time for building managers in each city to get together on these questions of service. Why should we destroy our net revenue by fighting over them? Let us compete as to quality, promptness and management of our service, rather than as to its quantity.

The *crème de la crème* of all papers, giving statistics and valuable data, ever presented upon any of all the subjects of building management, is C. T. Coley's paper upon the "Gross and Net Cost of Operating to Gross Rents," presented at the 1909 convention of Building Owners and Managers and printed in the October, 1909, Building Management. Every man who has studied it has been benefited, and every manager should furnish these same statistics for his building to an official compiler of this organization for annual publication, and in such a way as to avoid identification or exposure of private business matters. If it is possible, and I believe it is, some uniform system of accounting should be adopted by all of the building managers, which should be the same for each building, to the end that just and proper comparisons of each item of expense of operating and of the service and life of material and equipment could be made. So that the "deadly parallel" might be made a thing of real value, and our work as a whole brought to the very best state of perfection.

From the data at hand and from other investigations, where the service is approximately the same in point of items or quality, I can see but little difference in the average gross rents per square foot as between the North and the South, and the East, West and Central states. Where heat, light, janitor and other service is included, the lowest average "total gross" rent of any one building reported is eighty cents per square foot. I am almost or nearly certain there are some lower than this. The highest average reported is \$2.85. The greater number of individual buildings reported average "total gross" rents at around \$1.00 per square foot, only a very few above \$1.25; outside New York and

Chicago, all reports received showed less than \$1.75. In other words I find the location as to the section of this country does not vary the rate so very much and that it is the number of people passing the location, the congested commercial and financial and shopping districts which mostly varies the rate.

The information obtained as to difference in rates due to differences in location in the same building is so meager as to make it impossible for me to give you anything of value except as I have considered it elsewhere herein. In several instances in the same building, I find the high rate for space above the first floor equal to 300 per cent greater than the low rate, and about 100 per cent greater than the average rate, due apparently to facilities for advertising.

What effect does the management have upon rental rates? Is a general rental agency, by controlling a number of competitive buildings, in a better position to maintain rates, by destroying competition? It might seem so but the result of most of my inquiries lead me to the conclusion that in office buildings, as well as elsewhere, competition is the life of trade and has but little effect upon rental rates. As a matter of fact, it appears the personality of the manager, whether he be at the head of a general rental agency, or an individual manager, has more to do with the success of an office building than any one thing connected with it, except, perhaps, its location.

A diplomatic, energetic and enthusiastic manager, will, by the very influence of his personality, maintain a satisfied tenancy and keep his building filled with high grade tenants. He is the man who will organize his tenants into a veritable array of "boosters" for his building. He is the man who never loses an opportunity to "make good" to his tenants as well as to his employer, and who brags about his work and his building, and who enthuses his tenants and employes to do likewise. He is the man who realizes that a good office neighborhood is just as important and just as much sought for as a good residence neighborhood. That it is necessary to preserve this not only within his building as a whole, but upon each individual floor as well. He is careful to classify his tenants, locating like with like, and making each feel that he is on the best floor in the building, and that his neighboring tenants are of the very best.

He is the man who gives service to both tenant and owner, gives it cheerfully and quickly, and denies it just as cheerfully and withal so diplomatically as to make the tenant have confidence in him, and in any event, to feel that he is being treated justly and with proper consideration. Thus he makes his building the talk of the town, the Mecca to which all eyes turn when looking for first class office space. Thus he maintains a waiting list of good prospects from which he may choose the best. And thus he not only maintains his rates, but is able to secure higher rates than any of his competitors.

Success resolves itself into a question of honesty of purpose, energy, ingenuity, efficiency, enthusiasm, diplomacy and salesmanship, in which some make good, and others simply make good excuses.

Getting Tenants for a Building

By C. A. Patterson '

THERE are many ways of filling a building, but the methods most in use are by personal calls, the prospectus, local newspapers, signs and brokers.

The progressive manager gets the floor plans as soon as they are approved, lays out a systematic plan of action. If the building is located in a financial section he can expect a majority of his tenants to be in this line of trade. Should the building be the home of a bank, that often proves very helpful to the renting man, as the conveniences of offices in the same building as their bank will often appeal to prospective tenants.

The first and most essential thing to do is to see in person or write every possible prospective tenant in the city and point out to him the advantage of having his offices in your building. The most successful managers state that the personal call is the most effective means of renting space. As the features of different buildings vary so widely each manager should have at his tongue's end several reasons why the space he has to sell is desirable. No renting man can succeed without having a foundation of salesmanship.

By the time the building is completed a good prospectus ought to be sent out.

Some of the men renting the largest properties say that there is not at the present time enough attention paid to the prospectus. Expense should not be spared to make this book a masterpiece of printer's art. It should stand as a worthy representative of a modern building.

Of course, the exterior view and floor plans always appear, but besides this the best examples, show views of the corridors, illustrations of some offices, etc.

It has only been of recent years that the manager has put real selling talk into his prospectus. Formerly a simple statement of the service was apparently sufficient, but now we find such expressions as the following:

"You spend over half your life in your office. Why not have a pleasant and convenient one?"

"The Successful Officeman, as well as merchants, have modern, well equipped places in which to do business. You owe it to your business to be in the Best Building in the City. It pays."

"They say a man is judged by the clothes he wears. Do you not often measure a man's business by the same rule? You like to do business with the man who has a well lighted and convenient store or office."

In the prospectus there is usually a description, pointing out the features and innovations installed, and an example of arrangement given. The type effects of this are lost as it is shown, but the logical sequence of the argument is the reason for reproducing it.

THE BLANK BUILDING.

Location.

"Located at the northwest corner of.....street and.....avenue,

is in the 'new center' of the business of the city. Within one block either way on the same side of the street are located two of the largest dry goods houses in the city, and the two leading theaters. The highest grade mercantile stores and all the prominent office buildings and financial institutions are located within a block of this location. This causes a constant stream back and forth to pass its entrance. It is the busiest corner in the city.

Architecture.

"It is of classic design, the exterior being of Bedford stone and gray repressed brick. The light color treatment, together with the plain, but massive and substantial type of architecture, makes it, by far, the most beautiful building in the city.

Construction.

"The framework of this building is the most modern type steel construction, all structural steel being protected against corrosion or fire by concrete and tile. The only wood in the building is the finish and hardwood floors, which are laid on tile and concrete sub-floors.

Dimensions.

"The building is twelve stories high, has a frontage of 200 feet on..... street and 108 feet on.....avenue.

Entrance.

"The main entrance is on.....street, through a lobby, thirty feet wide, finished in white Italian marble. The lobby, together with the beautiful marble staircase, is one of the handsomest entrances to any office building in this part of the state.

Elevators.

"Three of the newest type Otis traction elevators, equipped with the latest safety devices, will furnish continuous elevator service.

"All freight and furniture enters the building through a sidewalk lift in.....street, and then is taken through the basement and up the freight elevator, so that at no time will the tenants be annoyed by having the main entrance or elevators blocked.

Arrangement.

"The corner room is occupied by The.....Trust and Savings Company, which company also has large storage vaults in the rear part of the basement.

"The.....Company, conducting a dry goods and department store, occupies a portion of the ground floor, part of the basement and all of the second floor.

"The northwest part of the building is occupied by the..... Theater, the leading playhouse in the city, access to which is through a beautiful entrance from.....street.

"The front part of the basement, under the Trust Company, is reserved for a café.

"The seven upper floors are used for office purposes.

Interior Finish.

"The interior finish, above the second floor, is mahogany. The floors in the offices are all hard maple. The corridor floors are tile, with a sanitary cove base.

Light.

"Every office room has outside windows, and the decoration of the walls has been done with the idea of getting such tones as will properly reflect the light.

"The artificial light is electricity, and this system has been installed after designs from the most competent electrical engineers. In addition to the center chandelier, outlets have been placed in the baseboards, so that desk lights can be had at any point in the room.

"Light will be furnished at all hours, day and night.

Heat.

"The building is equipped with the latest steam heating system, planned by competent engineers, and heat will be furnished twenty-four hours a day, including Sundays and Holidays.

Toilets.

"Each floor has toilet rooms for men and women. The fixtures and equipments in these toilets are the most modern and sanitary that can be secured.

Water.

"Each room is provided with a beautiful modern enamel lavatory, with hot and cold water.

Service.

"The janitor and elevator service will be maintained at the highest state of efficiency, and in the janitor work the most approved and sanitary methods will be employed. The entire building will be cleaned daily by a vacuum process, for which the whole building is piped, thus insuring a well cleaned, dustless and sanitary office to each tenant. It is the aim of the management to conduct the Blank Building in a manner wholly satisfactory to the tenants, to maintain the highest standard of service in all respects.

Other Conveniences.

"Telephone outlets for both systems have been placed in the baseboard at convenient locations about the rooms so that desk phone may be attached at any place in the room.

"Mail chutes will be found on every floor.

"All the windows are equipped with the latest improved metal weather strips. This eliminates dust, draughts and other annoyances experienced with the ordinary window.

"Further particulars may be had upon application."

Very often the managers get out a series of strong follow-up letters, with which they bombard the prospects until they either close or learn that there is no hope of closing them, and supplement this with personal interviews as much as possible.

During the last few years the renting signs have been given attention. Some managers claim to have secured tenants by using out-of-the-ordinary renting signs. The personal appeal is made along this line.

Rental Signs for Office Space.

PRESTIGE GAINED BY A FITTING LOCATION.

INSURE YOURSELF BY TAKING SPACE HERE.

**TAKE NO CHANCES ON HAVING YOUR QUARTERS
OPEN TO CRITICISM.**

ONLY THE BEST IS INEXPENSIVE.
PROSPERITY COMES TO THE PROGRESSIVE.
YOUR OFFICE HERE WILL DEMONSTRATE IT TO YOUR
SATISFACTION.

WOULD YOU LIVE IN A DARK, DINGY HOME?
OVER HALF YOUR LIFE IS SPENT IN YOUR OFFICE.
THIS OFFICE WILL APPEAL TO YOU.

Rental Signs for Store Space.
1,000 PEOPLE PASS THIS STORE ROOM
EVERY HOUR.

SOME MERCHANT WILL MAKE A FORTUNE IN THIS
SPACE.

WHY CAN'T IT BE YOU?
ARE YOU PROGRESSING?

TO GET A GOOD TRADE AND KEEP IT A SUITABLE STORE
MUST BE PROVIDED
LET US SHOW YOU THIS.

DO YOU REALIZE THAT DOING BUSINESS HERE WILL
MAKE SOME MAN THE LEADER?
ASK US ABOUT IT.

In selecting a tenant for your building the character of his business ought to be carefully looked into. There are several good reasons why this is advisable. Primarily the manager should satisfy himself that the prospect has the financial rating to take space, of course, but besides this, consideration should be given as to whether or not he will make a tenant that will increase or reduce the standing of the building.

One of the most prominent renting men of New York made the statement that if he would see in the daily paper an advertisement of a wild cat mining scheme or a radical industrial promotion giving his building as an address he would consider it an injury to the dignity of his property from which it would never recover.

Another manager in talking about his tenants compared his building with a city. He said: "I consider every corridor a street and make an effort to keep the neighborhood popular with high grade business men."

In former years the janitor was sent to show space, but now the managers have learned that it is best to show it personally or if unable to do this have a live renting salesman do it. Very often there are features about a suite of offices which will be the means of closing the lease but if these advantages are not pointed out they may slip the attention of the prospect.

A manager should study his building as a salesman studies his goods. He should be able to answer any question instantly and give reasons why that particular office should be rented by this very prospect.

A practical insight into the business of the prospective tenants who come to look for space often is of great help to the renting man.

The manager has three arguments which can be made more or less elaborate depending upon the building and his own originality. Loca-

tion always makes a good talking point, the special features are another and the service last but by no means least. In fact it is said by those having the least amount of vacant space that service does more toward keeping tenants than anything else. Old buildings often keep tenants at a good rental rate with new buildings in the neighborhood bidding for them at even lower prices.



The Renting Department

By C. F. Noyes

PROBABLY no department of the real estate profession requires more careful, persistent and expert attention than the leasing end of the business. That is, if a real estate firm is to be successful in this branch of its work. And, being successful means securing for their clients, who are the owners of the buildings intrusted in their charge, the maximum rentals that can be obtained consistent with securing good tenants and keep the building filled. A real estate office must keep in mind the fact that the fully rented building is not always the sign of a well organized renting department. But a fully rented and well rented building is such a sign.

Right here, I would like to discuss some of the conditions regarding the management of successful buildings, whether office buildings, store and loft structures, or apartment houses, that lead up to the successful renting of such structures, but I do not care to digress too much from my subject of leasing. Therefore I shall only refer to the fact that an agent thoroughly trained in handling any certain class of property can usually advise the owner more expertly regarding the proper improvements to be made to his property than any architect or builder. And before the leasing men of any office take up their work, expert knowledge is of great value. If an office building is planned, the agent with years of leasing experience should be consulted on such matters as dividing the ground floor of the building into desirable stores, the layout of the various office floors, the light arrangements and a hundred and one vital points that go to make up a building that can be fully and successfully rented. This applies also to the modern loft structure, the apartment house or the tenement property. And it applies more strongly to the store and loft building, because owners of this type of property seldom realize the maximum rental value from such buildings unless they consult with a live renting agent in the district in which the property is located and capitalize this renting agent's suggestions regarding minor improvements that will make the building more valuable from a rental viewpoint. If a store and loft building is located on a busy thoroughfare, the well trained agent who has served a faithful apprenticeship as a renting man can often make suggestions which, put into effect, will greatly enhance the rental value of the property. Many buildings in our charge are painted once or twice a year. Many of them are painted white. A foolish color scheme, the owner says when first the proposition is suggested. But this color, which needs replenishing once or twice a year, gives a cheerful, businesslike appearance, makes renting easier, and pays a splendid return on the investment. The lowering of the ground floor to the level of the sidewalk; the high, dry and airy basement often used for retail purposes; the installation of modern show fronts and show windows; the proper lighting fixtures; a little metal ceiling here and there; the handsome wood trim; the touch of mosaic tile at a store en-

trance—these are common sense requisites that the well trained leasing man thinks of the moment a building is placed in his hands to rent. The renting agent must see beyond the outward appearance of the building that he has for rent—his first thought must be, how can these premises be improved at a reasonable cost to secure the largest possible income return for the owner? In well located store property, the experienced leasing man often knows how a large store can be divided and rented to several tenants for much more than one tenant has been paying and much more than any one tenant could afford to pay. Experience is the one great teacher in this part of the business. And the head of the renting department of an office to expertly advise his clients on these matters must have a long experience in the district, and must know the business firms in that district, the rents the various lines of business can afford to pay, and then arrange his building or store to meet the demand of the neighborhood, always having in mind the necessity for securing the greatest possible, yet consistent, income for his client.

I have seen store rentals increased from \$5,000 to \$12,800 per annum; buildings from \$3,000 to \$5,800; lofts from \$1,200 to \$2,400 in districts where values were not jumping, but simply by using common sense and good judgment in advising the owners to make certain minor changes which should have been made long before, and in every case the new tenants were more contented and better satisfied under the new and improved conditions than were the old tenants who were paying a much lower rent. Our experience in this matter is the same as that of all other well organized renting offices.

The success of the man taking up the leasing end of the real estate business depends very largely upon himself. First of all he must take up the business in a serious way, intending to make it a science and a study as much as possible. He must be alert and on the lookout every moment. I cannot imagine any renting man who does not always think of his business and who does not involuntarily note all changes occurring in the various neighborhoods through which he may be passing, either on business or pleasure or on travel. A successful renting man must instantly know for what class of business premises should be offered that he has to rent, and he should know the firms to whom the property should be submitted. He should always notice and learn from the successful store merchants the type of premises that such merchants select, and when similar premises are offered for rent these merchants should immediately be seen and other similar lines of business should be carefully canvassed. The successful renting man must have a general knowledge of rental conditions throughout the entire city. If he is offering office building space for rent, he must be able to tell the prospective tenant the rental asked in all the prominent and high class down town office buildings, as well as the lower priced buildings, and then if requested must be in a position to give fairly accurate information on up town office buildings and even regarding the semi-office buildings such as have been erected in the Fourth Avenue section in New York. He must know the size and character of the space offered in all of these various buildings, the service that is given the tenant by the owners of these buildings, and be in a position to answer in an intelligent way all questions that may be asked him regarding the subject. In these busy days, the active business man will only deal with the one who knows. Information must be given quickly

and any evidence on the part of the renting man that he does not understand his subject thoroughly often proves fatal. If the renting man is talking loft space to large manufacturers, he must have a fairly good idea of the relative rentals on the extreme west side, the extreme east side, the better class of loft space in the central part of the city, as well as a general idea of what is being offered in Jersey for manufacturing purposes, or in the Bush Terminal buildings located in South Brooklyn.

This is the age of specialists and to be successful the renting man must know the subject of leasing and he must be able to tell his customers everything about the property he is offering as well as other similar properties in other locations. I well recollect when I first came to New York that this was so apparent to me that I took a memorandum book and on my hands and knees secured the inside measurements of even the smaller lofts that we secured rental particulars of. I figured out the net space on the floor, learned the height of the ceiling and even made a note of the number of windows that the loft had and whether there was an elevator, an electric hoist or a regular hoist in the building. I did this so that I would memorize the property and be able to better describe it when offering to a prospective tenant. And I believe if this was more frequently done, better results would be obtained by the renting man.

I have repeatedly used the term experience in connection with the successful renting man. I cannot too strongly emphasize this. The renting man to be successful must have long experience. Only long experience will teach him accurately the relative values of properties in various districts, where the tenants are and how to get them. Only experience will teach him how to attractively offer his proposition, to close his deal and not let a likely and logical customer slip through his hands and lease premises through a competing agent. He must start at the bottom and work up. He should go through the various departments and serve an apprenticeship in each. I would like to explain the duties of each department in detail, but will hurriedly pass through them. And I will refer only to the work done by the renting department of a well equipped office in the matter of securing property for rental purposes and renting successfully what it can of such properties. I do not refer to management, where there is much greater thought and work.

It is obvious that a successful renting office must have as much property as possible to offer prospective tenants in the district in which that office operates. And it must have this property as soon as it comes on the market for rental. This requires the services of a listing man. It is his duty to secure at least once a week a memorandum of all vacancies. He fills out a special slip for each building, store and loft that he finds for rent. These slips give general information regarding the character of the building and the space that is offered. They are turned over to an office man who fills in the size of the building from our maps, the owner's name and address, together with any other information that we may have in our plant regarding the building. These slips are immediately divided between two or three solicitors whose duties are to personally interview the owners and secure full particulars. Except in rare cases, letters are not written, because a personal interview is preferable. If particulars are secured the report is given to the renting man having charge of and being directly responsible for the results of the business in that district in which the property is located, and it is up to this renting man to in-

spect the premises, get accurate measurements of the space offered, and after noting all conditions he makes out another slip from which a renting card is made and this card goes before the office manager with the preliminary report. The listing man's report and the solicitor's report were originally made out in duplicate, so it is impossible for any delay in securing the final data.

Possibly a "to let" sign is to be put up on the premises offered for rent, and this requisition must go before other men to be properly checked, and the sign must be up the day it is ordered. Incidentally, these signs must be checked up at least every other week and at stated intervals reports must be made by the sign man and by the sign checker as to the condition of the signs, the number of signs up and the number of signs in stock. After the property has been listed the real work of the leasing department has just commenced.

A memorandum of every listing goes before the office manager, the renting manager of the office and the head of the firm. A copy of the property offered, if the premises are desirable ones, is sent out to all renting men, and this gives all an equal chance to capitalize their knowledge of the renting by securing, if possible, any tenant whom they think would be interested in such premises as are offered. As these records come through the office from the listing man and the solicitor, the office manager, the renting manager and the head of the firm make a note of such properties as appear to be desirable premises.

They confer regarding them. The draftsman of the office, and every office of size now has one, or more, is sent to the building or premises offered, and a thorough report is made as to its condition, possibly floor plans are drawn and often diagrams showing the neighborhood and the firms located in the district. The property is then turned over to the man having direct charge of the district in which it is located, with suggestions as to how it may be handled to advantage. Some letters are written and many personal calls are made on firms that can possibly use such space. All letters are followed up, but naturally the more likely prospective tenants are seen first.

Every stage of this department of the business is an interesting one, and if a renting office is well balanced, every one contributes something towards the success of the man actually securing the tenant.

Even with the tenant secured, all the work necessary to the earning of the commission has not been done. References must be looked into and leases must not only be drawn but they must be signed. Here again experience comes into play, because it often takes a well trained renting man to get the owner and the tenant to agree upon the form of the lease.

One of the greatest problems of the real estate office today is that of fixing the compensation for the renting man. The very nature of the renting man's work makes it extremely speculative. A few large transactions will often increase a man's normal yearly earning capacity two-fold. He should be paid in proportion to the services he renders his firm, and it is self-apparent that it is often difficult to tell in advance exactly what he should receive. For this reason the commission basis is largely in vogue in most offices, modified by a reasonable drawing account, which is usually along the lines of a guarantee. The objection to this commission basis is the fact that in a large office where there are a number of renting men, a commission basis often leads the renting man to attempt

to carry more deals than he is capable of properly following, and often good business is lost on account of pressure of other active business, the man having not had time to properly follow it. And in this connection, I cannot too strongly state that a live, active renting negotiation, no matter of what size, must be followed closely and persistently to insure a successful termination of the negotiation.

Personally, I believe the time is not far distant when all real estate offices doing a business of large volume will handle their entire organization along co-operative lines, and permit all employes to share in the profits of the office, and one reason for this is the fact that the renting men are the men who more than any one else are directly responsible for the success of any firm. Our office is now organized along co-operative lines. We believe we pay our renting men as well as our other employes salaries consistent with their earning capacity, and in addition to this, every one in our office, including our office boy, porters, sign man, stenographers, book-keepers and accountants, will receive a part of our profits. Under this co-operative arrangement our renting men will receive that proportion of our profits to which their services entitle them, and payments will be made in proportion to the success of their efforts. And I want to say that I believe the continued success of any real estate office is dependent more largely on its renting department than any of the other two or three departments which must necessarily be maintained.



A Specialized Building

By Charles Fellowes

AS the subject of specialized renting is an unfamiliar topic to the majority of building owners and managers, there having been so little discussion of this method of renting space, some facts in connection with the Reliance Building of Chicago, covering one of the specialized lines, may be of interest.

With the exception of a limited number of dentists, this property above the first floor is devoted exclusively to physicians, very nearly three hundred having offices therein. The building is located at State and Washington streets, diagonally opposite the great retail store of Marshall Field & Co. The building, which is modern in every particular, has fourteen floors, with a lot dimension of 56x85 feet. The store room on the first floor, about 39½x83½ feet, including basement, is occupied as a drug store and is leased for a long term at an annual rental of \$40,000. Ordinarily the publication of rentals might perhaps be considered as violation of good business or renting principles, but conditions on State street are exceptional, and managers of properties thereon seem to have no special reason for reticence in discussing them. The rental just stated, which is less than is paid for space in some other cases, is mentioned with the thought that it may be interesting to some who are not familiar with the conditions in the great shopping center of Chicago, in which district the rents paid for store space are higher than those secured in any American city. This is due to the centralization of the large retail stores and other interests.

As previously stated, the space above the first floor is rented to several hundred physicians. Three forms of lease are made: First, a term of three or five years for all-day occupancy; second, a term of three or five years for half-day occupancy; third, a term of two years for occupancy for one or more hours per day, under which plan the offices are furnished and equipped by the building, the completeness of the equipment being such that it is only necessary for the physician to furnish medicines and instruments.

It was the original intention to rent one-half of the building to physicians and dentists and the remainder of the space to mercantile people, which was done. Such success was attained, however, in renting to physicians that the mercantile space was gradually absorbed, and for many years the property has been devoted to the professional people.

The building has been arranged, equipped and maintained with a view of providing maximum of comfort and convenience, and efforts made to incorporate any new features from time to time which it was thought would add to the attractiveness and utility of the space, and thus keep the building as nearly as possible on a standard to equal that of any building of the most recent construction. This policy, with the special and complete equipment to meet the requirements of this class of tenants, has placed the building in a position where competition thus far has scarcely been noticed.

A large amount of glass has been used, so that the offices are unusually light. The rooms have been arranged with an independent exit from each consulting room. This has added to the cost of construction, but is an important feature, as there are special reasons for occasionally dismissing patients privately and unobserved. These exits have generally been provided by a series of private corridors for the joint use of adjoining suites.

Retiring rooms directly connected with consulting rooms have been provided in many cases and are a great convenience to the physicians having large practices. This feature enables a physician to attend a patient while the one whom he has just attended can be assigned to the retiring room in the event that he is not in a condition to leave immediately.

Each office is provided with compressed air for nose and throat sprays and for various other purposes. Rooms with special features for eye, ear, nose and throat specialists are provided, as well as general surgeries in which minor operations are performed, the major cases being cared for at the hospitals.

An intercommunicating telephone system is provided, with a telephone in each office, so that a tenant may communicate with the occupant of any office in the building.

A medical library was at one time maintained, but as the time of the average physician is too limited to permit its frequent use it was discontinued.

A portion of the second floor is fitted as a space where a scientific régime in hydrotherapy, massotherapy and electrotherapy is given to patients upon prescriptions of the attending physicians by expert attendants under medical supervision. This space is attractively finished in marble, and is supposed to contain almost every remedial, mechanical, electrical, or other device, approved by medical profession, or to furnish anything from an ordinary bath to a "Finsen light treatment" or "indoor electric sun bath;" in other words, almost every recognized legitimate remedial agent which it is practicable to have, used in the treatment of disease, outside of medicine itself, is supposed to be available in this space, the institution having been established to meet the wants of physicians. This is not operated by the building, but by a physician who leases the space.

Physicians' and surgeons' supplies of all kind are kept and can be secured at the drug store, so that there is hardly a want of a physician in connection with his work that cannot be supplied within the building.

Only physicians of good professional standing are admitted. Those who advertise are debarred; in fact, professional reputation is such an important factor that if advertising be done in a manner prohibited by the code of ethics of the American Medical Association by a tenant the lease has been violated and can be canceled by the landlord with claim for damages. The lease is also of sufficient elasticity to cover other unprofessional conduct which might be detrimental to the building.

Careful attention is given to the selection of tenants who jointly occupy offices, with a view of securing the greatest harmony of interests. In some cases a combination may consist of a general practitioner, a surgeon, an aurist, an oculist, nose and throat specialist and men representing other lines; men, perhaps, who have the same college, hospital or other affiliations, and by occupying offices jointly each is able to advance the interests of the others, especially in the way of referring patients.

Two floors of the building are furnished and equipped by the manage-

ment for tenants who desire office accommodations during a part of the day only. From the main hall on either of the floors the visitor enters a general reception room which will accommodate one hundred persons without crowding or even unpleasant contact. These reception rooms are presided over by lady attendants, who receive all visitors and notify the physician they wish to consult. This is done by means of telephones or electric signals which connect the reception room with the different consulting rooms grouped around it.

The rooms are fitted up with a degree of elegance to immediately command attention, and, in addition to general office furniture, each consulting room contains a large desk made especially for the purpose, with glass writing top, drawers and private lockers for medicine and instruments, with special locks for each tenant, an operating table or chair and toilet cabinet. Included, also, are towels, gas, telephone, electric light, electricity for apparatus, compressed air, and in some rooms apparatus and appliances for nose, throat and eye work. In other words the equipment is so complete that everything is in readiness for the physician, without any outlay on his part outside of the payment of his rent.

This plan of renting is of mutual advantage. The tenant who requires only a portion of a day does not pay for unused time, and while the rental is at a higher rate it results in a saving to him, besides securing a better return for the landlord. There are other advantages. Occasionally an applicant desires an office when there is no space available to meet his requirements. In such cases it not infrequently happens that the applicant will rent space on this plan where everything is in readiness until such time as an office can be secured which he is willing to rent permanently or for a long term.

It has frequently occurred to the writer that perhaps this plan might be used to some advantage with a reasonable amount of space in some of the mercantile buildings. There are, doubtless, many persons who require only a portion of a day, who might rent on this plan if the rooms were properly arranged and furnished, with competent attendants in charge to handle callers, receive and convey messages, and attend to other matters outside of, as well as during, the time the tenant occupied the office.

It has not been the intention of the writer to enter into the question of specialized renting in a general way, as he has not made a study of the subject along broad lines, but merely to cover some facts, in connection with the property under his charge, which he thought might be interesting. Touching upon it briefly, however, it is obvious that the conditions for the successful renting of a large building to one class of tenants, if favorable at all, are only so in the largest cities, where there is an unusual concentration of interests.

Specializing in several lines has been done to advantage by some buildings when it might have been very unsatisfactory to have catered to one. The principal advantages are the facilitating of renting after headway has once been gained, and greater ability to retain tenants. The assembling of a class of people engaged in the same line, even though on a competing basis, who have many interests in common, promotes better and more profitable relations, and to that extent is an inducement, in addition to any attractiveness inherent in the building itself or its location, to prospective tenants to make leases, and the tenants themselves to renew leases.

How Leases Should be Made

By L. L. Banks

THE question of office building leases is one, to my mind, of great importance: It looks innocent enough, but is really difficult in its very simplicity. Before taking up this subject in detail, I consulted managers of various buildings throughout the country, and their replies amply confirmed my opinion that local conditions, necessarily, must largely govern the making of leases, and that no fixed rule can be laid down that will take care of all cases; in fact, each separate lease is a case in itself.

I shall endeavor to discuss the subject under two separate headings: The Construction of the Lease and the Period for Which It Should Be Drawn. Under the former heading, I must abstain from coming into too close contact with the legal phase of the subject, because I am not of the legal profession and because, further, the laws of the different states vary greatly as regards landlord and tenant. I will, therefore, endeavor to sketch the more important features of a lease as it might be drawn under the laws of the State of Pennsylvania.

Broadly speaking it should contain the following:

1.—The date under which the agreement is made, regardless of the date it takes effect.

2.—The name of the lessee (if an individual or individuals) in full, not merely the initials of the first and middle names. If a co-partnership, the names of the co-partners in full as well as the firm name under which they transact business; if a corporation, the name of the corporation in full as well as the name of the state or territory under whose laws it was organized and exists.

3.—A definite description of the space leased, giving room numbers and floor. If the former is impracticable, attach a blue print or sketch describing the space.

4.—A definite description of the business to be transacted on the premises. This is necessary to the building whose management is discriminating and desires to maintain a high standard among the tenants, and consequently, a good reputation for the building.

5.—A distinct specification of the term of the lease in years and months; also the dates of the commencement and of the expiration of the term. By all means, have a definite expiring period, be it April first, May first, or September first. This is nothing but systematic.

6.—Specify the total rental for the entire term of the lease, and whether payable monthly, quarterly or semi-annually, in advance or at the end of the period, and where payable.

7.—A clause providing that if the rent or any part of same shall at any time be in arrears and unpaid, or if the tenant shall fail to comply with any of the covenants, terms and conditions of the lease, or any notice given thereunder, or if the tenant shall remove, attempt to remove or manifest an intention to remove any of the goods and chattels from the premises without having paid the entire rent for the term, or if he should

make an assignment for the benefit of his creditors, or if an execution be issued against him, or if a petition be filed by or against him to have him adjudicated a bankrupt, or if his estate be brought into liquidation by any means whatsoever, or in case he should desert or vacate the premises, then, and in any such case, the rent for the entire unexpired portion of the lease shall thereupon become due and payable and a landlord's warrant may be issued forthwith on the lease and prosecuted to sale for collection of the rent, and all charges due under the covenants of the lease. The landlord should also have the right to relet the premises, as agent for the tenant, for any unexpired portion of the lease, and to receive and retain the rent therefor, until all sums owing the landlord under the lease shall have been satisfied.

8.—A clause providing, also, that under any of the above mentioned conditions the lease may, at the option of the landlord, be forfeited and terminated, and upon the termination of the lease by forfeiture or otherwise, any attorney may immediately thereafter, as attorney for the lessee, at the request of the landlord, sign an agreement for entering in any court of competent jurisdiction an amicable action and judgment in ejectment, etc.

9.—A clause providing that, in addition to the other remedies given in the lease and by law, any attorney is authorized and empowered to appear for the lessee in any court and confess judgment against him, for any amount due under the lease, with interest, costs of suit and 10 per cent attorney's commission for collection.

10.—A clause providing that if the building is injured by fire or other casualty, not occurring through the negligence of the tenant, so that the premises are rendered wholly unfit for occupancy and cannot be repaired within sixty days, then the lease shall cease and determine from the date of such injury and the tenant shall pay the rent apportioned to the time of such injury and immediately surrender the premises to the landlord, who may enter upon and re-possess the same. If the injury can be repaired within sixty days, the landlord may enter and repair and the lease shall not be affected in any manner, except that the rent shall be apportioned and suspended while the repairs are being made. If the premises are so slightly injured as not to be rendered unfit for occupancy, then the landlord shall agree that the same shall be repaired with reasonable promptitude, and in that case, the rent accrued or accruing should not cease or determine. Under no circumstances should the landlord be held liable for any loss or damage sustained by the tenant by reason of fire.

11.—A clause binding the tenant to keep the premises in as good order and condition as the same were at the beginning of the term, reasonable wear and tear and damage by fire and other casualty, not occurring through the negligence of the tenant, excepted; also binding the tenant to make no alterations, additions or improvements without the written consent of the landlord, and then with the understanding that all such alterations, additions and improvements made by either the tenant or the landlord, except movable office furniture, put in at the expense of the tenant, shall at once become and be the property of the landlord and shall remain upon and be surrendered with the premises at the termination of the lease, without being molested or injured.

12.—A clause binding the tenant not to use, or allow to be used, the

premises for any other purpose than mentioned, nor to manufacture any commodity, nor to prepare food or beverages therein, nor assign the said lease, nor under-let the said premises, or any part thereof, without the written consent of the landlord, under penalty, at the option of the landlord, of having the monthly installments of rent doubled, with the right to collect same as hereinbefore provided in case of nonpayment of rent.

13.—Also a clause providing that whenever the tenant holds possession of the premises, after the expiration of his lease, with the consent of the landlord, same shall be construed as a renewal of the lease with all of its covenants, for a like period for which the lease was originally drawn, and so for every term thereafter during which such tenancy shall continue or holding over take place.

14.—Clearly define the various kinds of service that are to be furnished or performed by the landlord, agreeing that all ordinary cleaning, repairing and restoring of the elevators and other mechanism shall be effected after business hours, but reserving the right, in case of special necessity, to suspend the operation of one or more of the elevators, or, in extreme cases, of all of them, without being in any way liable to the tenant. If it is your custom to furnish electric light gratis, then at least put in a clause in which reserve the right, in case the tenant, in the judgment of the landlord, is using the electric current in an extravagant manner, to compel the tenant to put in a meter or meters and pay for the excess amount used, or in default thereof, to cut off the supply.

15.—The tenant should be required to give prompt written notice of any accident to or defects in, the water pipes, electric wires or warming apparatus, so that same may be attended to promptly. Have it distinctly stated that the landlord shall not be liable for any damage to any property on the premises or in the building, from water, rain or snow, which may leak into, issue or flow from any part of the building, or from the pipes or plumbing of the same, or from any other place or quarter. Nor shall the landlord be liable for damages to person or property which may result from the operation of the elevators, or from any other cause in said building.

16.—Reserve the right to enter the premises at reasonable hours in the day or night to examine the same, to run electric wires, to make such repairs, additions and alterations as the landlord shall deem necessary for the safety, preservation, improvement or restoration of the said premises, or any part of said building, or for the safety or convenience of the occupants thereof, without being in any wise liable to the lessee for damages.

17.—Last but not least, incorporate in your lease a set of rules and regulations for the government of the building. To my mind, those rules are all-important and will help you out of many a tight place. I will quote verbatim the rules and regulations of the Park Building, Pittsburg, Pa.

Rules and Regulations of Park Building.

1.—The sidewalks, halls, passages, elevators and stairways shall not be obstructed by any of the tenants, nor used by them for any other purpose than for ingress and egress to and from their respective apartments.

2.—Tenants, their clerks or servants, shall not make or commit any improper noise or disturbances of any kind in the building, smoke tobacco in the elevators, or mark or defile them, or mark or defile the water-closets, or toilet rooms, or the walls, windows or doors of the building, or

interfere in any way with other tenants or those having business with them.

3.—No carpet, rug or other article shall be hung or shaken out of any window, and nothing shall be thrown or allowed to drop by the tenants, their clerks or employes out of the windows or doors, or down the passages or skylight of the building, and no tenant shall sweep or throw, or permit to be swept or thrown from the leased premises, any dirt or other substance into any of the corridors or halls, elevators or stairways of said building, or into the light well thereof.

4.—The floors, skylights, windows, doors and transoms that reflect or admit light into passageways or into any place in said building, shall not be covered or obstructed by any of the tenants. The toilet-rooms, water-closets, and other water apparatus shall not be used for any other purpose other than those for which they were constructed, and no sweepings, rubbish, rags, ashes, chemicals, or the refuse from electric batteries, or other unsuitable substances, shall be thrown therein. Any damage resulting from such misuse or abuse shall be borne by the lessee by whom or by whose employes or visitors it shall be caused.

5.—No linoleum, or oil cloth, or rubber, or other air-tight covering shall be laid upon the floors, nor shall articles be fastened to, or holes drilled or nails or screws driven into the walls or partitions, nor shall the walls or partitions be painted, papered or otherwise covered, or in any way marked or broken, without the written consent of the lessors.

6.—Nothing shall be placed on the outside of the building, or on the windows, window-sills or projections.

7.—No sign, advertisement or notice shall be inscribed, painted or affixed on any part of the outside or inside of said building, unless of such color, size and style, and in such places upon or in said building, as shall be first designated by the lessors. Signs on doors and windows will be painted for the tenants by a sign-writer appointed by the lessors, the cost of the painting to be paid by the lessee. Directories in conspicuous places, with the names of the tenants, will be provided by the lessors.

8.—Lessors will furnish, on application, window shades or awnings of uniform style or color, but the net cost shall be paid by the lessee, who shall have the right to remove the same at the expiration of the lease. No other shades or awnings shall be put up.

9.—If the tenants desire to install telephones, call boxes, telegraph wires or other electric wires, the lessors shall direct where and how the same are to be placed. No wires shall be run in any part of the building excepting by or under the direction of lessors' agent. The attaching of wires to the outside of the building is absolutely prohibited. Electric light apparatus shall not be disturbed or in any way interfered with by lessee, his agents or servants; all work upon or alterations to same shall be done only by such persons as may be authorized by lessors.

10.—Lessors shall have the right to prescribe the weight and proper position of iron and steel safes, and no safe shall be hoisted or placed in any part of the building except under the direction of the lessors' agent. No furniture or bulky articles shall be carried up or down the stairways of the building, or otherwise than on the freight elevator, and then only at such times, and under such regulations as may be prescribed by lessors. Furniture and other articles to be handled in the freight elevator shall be first unpacked in the room designated for that purpose in the basement or attic of the building.

11.—Lessee must, upon the termination of his lease, leave the windows and doors in the demised premises in the like condition as at the date of commencement of said term, and must then surrender all keys delivered to him. No additional lock or locks shall be placed by the lessee on any door in the building unless written consent of the lessors shall have first been obtained. A reasonable number of keys will be furnished by the lessors. Neither lessee, his agents or servants, shall have any duplicate keys made.

12.—No tenant shall do or permit anything to be done in said premises, or bring or keep anything therein, which will in any way increase the rate of fire insurance on said building or on property kept therein, or obstruct or interfere with the rights of other tenants, or in any way injure or annoy them, or conflict with the laws relating to fires, or with the regulations of the fire department, or with any insurance policy upon said building or any part thereof, or conflict with any of the rules and ordinances of the Board of Health.

13.—In order that the leased premises may be kept in a good state of preservation and cleanliness each lessee shall, during the continuance of his lease, permit the janitor of the lessors to take charge of and clean the said leased premises.

14.—No tenant shall employ any person or persons, other than the janitor of the lessors, for the purpose of such cleaning or taking charge of said premises, it being understood and agreed that the lessors shall be in nowise responsible to any tenant for any damage done to the furniture or other effects of the tenant by the janitor or any of his employes, or any other person, or from any loss of property from leased premises, however occurring. Tenants will see that the windows are closed and the doors securely locked before leaving the building.

15.—No animals or birds shall be kept in or upon the premises.

16.—No machinery of any kind will be allowed to be operated on the premises without the written consent of lessors.

17.—The carrying of ice in the elevators or on the stairways or in the halls of the building is positively forbidden between the hours of 7:00 a. m. and 7:00 p. m.

18.—The use of rooms as sleeping apartments or for any immoral or illegal purpose, is absolutely prohibited.

19.—Tenants are prohibited from giving fees to employes of building.

20.—Lessors reserve the right to make any or all alterations in said building as may be required by lessee, the expense of such alterations to be paid by lessee.

21.—All damage done to the leased premises, or to the corridors, through the carelessness or negligence of the lessee or his employes or agents, shall be repaired by the lessors and the cost of same paid by the lessee.

Now, as to the length of time for which a lease should be drawn, there are many relative circumstances that must be considered, such as the building's location in the city's business district; the trend of real estate values; the question of supply of, and demand for, office space; the line of business in which the prospective tenant is engaged; the amount of floor space he will require; what alterations will be necessary to adapt the space to his requirements; and last, but not least, his financial and moral responsibility.

It is my own belief, after an experience of almost fourteen years in one large office building, that five year leases are the most satisfactory to the owner and to the tenant alike, provided, of course, they are made judiciously. I do not believe a lease should be made for less than three years, where more space than one small room is involved, and when extensive alterations are required, the lease should be for at least five years.

Tenancy-at-will and month-to-month leases and even too many one-year leases have a tendency to make the tenants of a building more or less transient and this certainly does not help the standing of a building. On the contrary, I believe that a rule of no lease for less than three years (other than for small spaces, as above mentioned) would tend to bring a better class of applicants, who, usually are of a more substantial character. Even in the case of small single rooms, if the prospective tenant is responsible and carries on a legitimate business, he will not, usually, object to making a lease for at least a year; if he does, nine times out of ten he is not the sort of tenant that a first class building wants.

It is well enough to say "We don't need long leases; we give our tenants high grade service and there is no need for their leaving our building. If they are dissatisfied, we don't want them in the building anyway." But, in my opinion, if a building gives this high grade service, every possible effort should be made to get long leases and then satisfy the tenant. With long term leases in a well conducted building, the tenants are likely to feel at home before their leases have expired, and they are more apt to remain permanently, whereas, with short term leases, some of them may, for fancied or trivial grievances, quit the building, to their own and to the owner's disadvantage.

Furthermore, it is anything but economical to make alterations to suit the requirements of tenants for a term of less than five years; at the best, alterations are troublesome and expensive. Each incoming tenant expects the premises to be put in first class condition and suited to his requirements. If his lease is for one year and he decides to move out at its expiration, you have the job to do over again for the next tenant and so on ad infinitum. If the lease were for three or five years, the probabilities are that very little, if any, decorating and repairing would have been necessary during the term. This means a saving in paint, varnish and labor, to say nothing of a saving in wear and tear to the building as a result of frequent movings; besides, these frequent movings do the reputation of a building no good.

Of course, in this paper, I have in mind, principally, the cities in which the office building business has been greatly overdone. Pittsburg is certainly in this class, and there are undoubtedly many others. Those larger cities that have not felt this condition as yet, will sooner or later. With a condition such as this isn't it good policy to make as many long leases as possible?

The procuring of tenants, does not, perhaps, come under my subject, but the practice in vogue in a few of the larger cities, where new buildings have recently been erected, is such that even a reasonably long lease in an older building will not deter the owners or agents of the new ones from "buying" tenants. I know of instances, and a number of them, where tenants in older buildings have had two-year leases assumed, their moving expenses paid and larger and more expensive space in a new building given

them for the same annual rental they were paying in the older building, in order that they might be secured as tenants for the new building. Does this kind of competition strike you as fair? Would this not be an added reason or incentive to get leases for as long a term as possible, even if there were no other?

None of us are in this business for fun; a very few of us, perhaps, are operating monuments without regard to profits, but the vast majority of us are on the job to make money and make as much as possible, and there is no better way to do it than to get a building filled with good tenants on long leases and then give them the best service you know how; such service that it will take more than ordinary inducements to make them leave you.

One thing is sure, however, no matter for what term you rent, insist upon a written lease; put your tenants under a set of rules and regulations. This tenant-at-will business is not the proper arrangement for a high grade office building; it encourages a cheap clientele and sooner or later the reputation of the building will suffer.



Legal Relations of Landlord and Tenant

By C. J. Fuess, LL. B.

THE relation of landlord and tenant may be defined in general terms as that which arises from a contract by which one person occupies the property of another with his permission, and in subordination to his rights, the occupant being known as the tenant, and the person in subordination to whom he occupies, the landlord. It is essential to the relation that the occupancy be both permissive and subordinate, and liability as between landlord and tenant rests upon privity, both of estate and of contract.

To create the relation of landlord and tenant there must be a valid contract between the parties, either express or implied, which for its validity depends on the same principles as other contracts, such as the presence of a sufficient legal consideration, and which involves mere rights of property.

While the reservation of a rent is made an essential to a lease by many of the definitions, it is well settled that the relation of landlord and tenant may arise without a reservation of rent. Rent, when reserved, may be in services, or some other consideration.

The contract by which the relation of landlord and tenant is created is usually known as a lease, which, according to a commonly accepted definition, is a species of contract for the possession and profits of land and tenements, either for life, or for a certain period of time, or during the pleasure of the parties. No particular words are necessary to create a lease, and whatever is sufficient to explain the intent of the parties that one shall divest himself of the possession, and the other to come into it, for a determinate time, amounts to a lease.

A lease or an agreement for a lease must be supported by a sufficient consideration in order to be valid. The demise of a leasehold estate is a sufficient consideration for the lessee's undertaking to pay rent; and conversely payment of rent is a sufficient consideration for the demise.

To make a good lease, and thus create the relation of landlord and tenant, while no particular words are necessary, it is indispensable that it should appear to have been the intention of one party to dispossess himself of the premises, and of the other to enter and occupy as the former himself had the right to do, pursuant to the agreement between them. A memorandum expressing the consent of the owner that another shall have immediate possession of premises, and shall continue to occupy them at a specified rent and for a definite term, is a sufficient lease. In general, any agreement under which one person obtains the right of enjoyment to property of another, with his consent and in subordination to his right, may create the relation of landlord and tenant. As between parties, an agreement may be a lease, while as to third persons it may be construed as a building contract. Where an instrument has the effect of giving the holder an exclusive right of occupation of the land, although subject to certain reservations, or to a restriction of the purposes for which it may be used, it is in law a demise of the land itself.

It is generally held to be essential to the validity of a lease that it prescribe with reasonable certainty the date of commencement and the duration of term of the lease.

The general rule is that a lease takes effect so as to vest the estate or interest to be conveyed only from its delivery and not from its date, or the time the signatures were affixed to it; and there can be no delivery without an acceptance, express or implied. While delivery, in the popular acceptance of the term, implies a manual transfer of possession from one person to another, yet, where the lessee by formal assent or unequivocal acts, such as entering into possession, treats the instruments as in his possession, it is sufficient to constitute a delivery. The delivery is complete where the lessor has put it beyond his power to rescind the agreement or recall the instrument of lease.

Of course, it is the duty of the tenant to so use the leased property as not unnecessarily to injure it. A tenant is liable, in the absence of an express agreement to the contrary, for causing a permanent injury to the demised premises over and above the ordinary wear and tear, when such injury to the premises is caused by his wrongful act or negligence. The measure of care which a tenant must use to avoid responsibility is that which a person of ordinary prudence and caution would use if his own interests were to be affected and the whole risk were his own. A tenant is not liable for such wear and tear as is incident to the business conducted on the premises, nor is he liable for injury to, or destruction of the premises by fire, where he has not been negligent. The liability of the tenant extends to the acts of his servants and business associates. The right to sue for injuries committed by the tenant or those for whose acts he is liable, is not waived by the subsequent acceptance of rent, nor by the execution of a new lease, nor by the acceptance of a certain sum in consideration of the surrender of the lease. But an agreement to stop the litigation for injuries and surrender the lease is based on a sufficient consideration to preclude the right to afterward recover damages.

A landlord may enjoin his tenant from acts causing an injury to the reversion, where such injury will probably be irreparable, or cannot be compensated in damages recoverable in an action by law.

Where a tenant has covenanted not to sublease or underlet, without the landlord's consent, he will be enjoined from breaking the covenant; and if an assignee is bound by the covenant, he, too, may be enjoined from breaking it.

There is a well defined distinction between the assignment of a term for years and a sublease or underletting. Accordingly, a restriction in a lease against assigning is not violated by an underletting, and a restriction against underletting is not violated by an assignment. Generally speaking, if the lessee parts with his entire interest in term it constitutes an assignment and not a subletting, although the instrument of transfer is in form a sublease; but if the lessee reserves to himself a reversionary interest in the term, it constitutes a sublease, whatever the form of the instrument of transfer. And as between the parties to the original lease, or as between the lessee and his transferee, if the instrument is in form a sublease, it will operate as such, although the lessee parts with the entire term. The distinction between an assignment and a sublease depends not upon the extent of the premises transferred, but upon the quantity of interest which passes.

A written lease may be extended by parole.

A lease may be renewed or extended by an indorsement on the original instrument.

If the lessor accepts a surrender of the premises, even after the holding over begins, the lease is terminated, and a subsequent occupation upon a re-entry without the landlord's consent is not as tenant.

If the tenant permits a third person to occupy the premises, it is in law considered to be the tenant's occupancy and is followed by the same consequences, and this rule applies to the occupancy of subtenants. The holding over by an assignee of the lessee will bind such assignee as a tenant under the terms of the original lease.

Where the lease is to two, only one of whom occupies, it is held that his holding after the expiration of the lease may be presumed to be by both unless the other gives notice that he ceases to hold.

Except as otherwise modified by statute, and in those jurisdictions where implied tenancies from year to year are not recognized, if a tenant under a lease for a year or longer without any other agreement with his landlord in that regard, holds over his term, then, upon the theory that he becomes a tenant from year to year, he may be held for another year, and if he pays and the landlord accepts rent, neither can terminate the tenancy for that year before its expiration. If the original term is for a period less than a year, however, then the holding over will operate to renew the tenancy for the original period and not for a year.

A tenancy from year to year may arise either expressly, as when land is let from year to year, or by a general parole demise, without any determinate interest, but reserving the payment of annual rent; or by implication, as when property is occupied generally under a rent payable yearly, half yearly, or quarterly; or when a tenant holds over, after the expiration of his term, without having entered into any new contract and pays rent. Such a tenant, however, will not be created contrary to the intent of both parties, and payment of rent is merely a fact bearing on the question of intent.

A landlord may treat a tenant holding over after a term as a tenant from year to year or as a trespasser, at his election.

Where a lessee for years holds over after the expiration of his term, and becomes a tenant from year to year, the tenancy is subject to all the covenants and stipulations contained in the original lease, so far as they are applicable to the new condition of things.

A tenant from month to month does not become a tenant from year to year by continuing in possession for more than a year. The character of the tenancy remains unchanged.

To constitute a tenancy from month to month a special agreement to that effect may be made, or the tenancy may be implied from the manner in which the rent is paid. Thus a lease for an indefinite term, with monthly rent reserved, creates a tenancy from month to month. Such a tenancy is a continuing one, and not a new tenancy at the beginning of each month. A tenancy for a specified period of one month is a term for years, and not a tenancy from month to month or year to year; nor does the mere payment of one month's rent with nothing further said or done, create a tenancy from month to month. A tenant who enters by an implied license becomes a tenant by sufferance, and out of this relation a tenancy from month to month may arise by the monthly demand and payment of rent. So also

a lease creating an estate at will only may be converted into one from month to month by entry thereunder and payment of monthly rent.

A holding over by a tenant from month to month with the assent of his landlord will, in the absence of a new lease, be presumed to be on the same terms as the prior letting.

According to the weight of authority, the lease of a portion of a building for a store or other business purposes, gives the lessee the exclusive right to the use of the outer walls of the portion of the building so leased by him for the purpose of posting advertisements and notices thereon.

It may be broadly stated, in the absence of fraud or concealment by the lessor of the condition of the property, at the date of the lease, the rule of caveat emptor applies since there is no implied warranty on the part of the landlord that the premises are tenantable, or even reasonably suitable for occupation. It is held, however, that there is an implied obligation on the part of the lessor that the leased premises shall be completed and ready for occupancy at the commencement of the term.

Any disturbance of the lessee's possession of the premises by the landlord, or the removal of personalty appurtenant thereto, entitles the lessee to recover from the lessor for the damage sustained thereby.

In the absence of statute, or of express covenant or stipulation in the lease, the lessor is not bound to make ordinary repairs to the leased property, nor to pay for such repairs made by the tenant. Nor under such circumstances can there be any recovery from the landlord for injuries resulting from such defects, unless they were of such character at the beginning of the lease as to amount to a nuisance.

A promise to repair, made by a landlord to his tenant during the tenancy, with no other consideration than such tenancy, is a nudum pactum, and cannot be enforced. An acceptance of a lease, containing a covenant to deliver up the premises at the end of the term in as good order and repair "as the same now are or may be put into by the lessor," is a sufficient consideration for a contemporaneous agreement, a part of the same transaction, in which the lessor binds himself to make certain repairs forthwith; and where a tenant refuses to pay rent unless repairs are made, and is notified to quit, he may regard the lease as ended, and a subsequent promise of the landlord to make repairs if the tenant will stay at the same rental is based on a sufficient consideration.

In the absence of a stipulation in the lease to that effect, the landlord cannot enter on the leased premises during the term to make repairs, although such repairs are necessary from the unsafe condition of the premises, where no obligation is imposed upon the landlord to make such repairs, either by statute, or in the terms of the lease. A covenant on the part of the landlord to make certain specified repairs implied a license by the tenant to the landlord to enter upon the premises for a reasonable time for the purpose of executing such repair. However, the landlord's right to make needed repairs does not extend to the disturbance of the tenants in the enjoyment of the premises further than is absolutely necessary to put and keep them in the same condition they were in when the lease was made, and if he goes beyond this limit he is a trespasser.

As a general rule rent does not accrue to the lessor as a debt until the lessee has enjoyed the use of the land. Liability for rent, however, does not always depend upon the actual occupation of the premises during the time for which recovery is sought.

A lessor who has consented to a change of tenancy and permitted a change of occupation, and received rent from the new tenant, cannot afterward charge the original tenant for rent accruing subsequently to such change. An agreement to release the original lessee and accept another tenant in his stead need not be express, but may be inferred from the conduct of the parties.

If the day on which rent would become payable is a holiday, the rent nevertheless falls due then, though the fact that it is a holiday extends the time allowed to the lessee to pay it. Thus, if the rent is payable on September 1st, and that day is Sunday, the rent falls due on Sunday, but the tenant has all of Monday in which to make the payment.

When no other place is fixed for the payment of rent, it is payable upon the land out of which it issues.

In order to be assured that no question shall arise as to the place at which it is to be paid, a specific agreement as to that point should be made.

But a tender of payment to the landlord is good either off or on the land.

After rent becomes due the landlord is entitled to interest from the due date.

Where rent is specifically received for a subsequent period the presumption is that the prior rent has been paid. Of course this is a presumption merely and is rebuttable.

In the absence of any agreement on the subject the landlord is under no obligation if the tenant unjustifiably abandons the premises during the term to re-let them, but may rest on his rights under the lease, and hold the tenant liable for rent as it accrues. Such a course, however, is useless in a case where an ex-tenant is financially irresponsible.

If there is no provision in the lease in reference to repairs, the tenant is still under an implied covenant to make what are called "tenantable repairs"; "to treat the premises demised in such a manner that no injury be done to the inheritance, but that the estate may revert to the lessor undeteriorated by the willful or negligent conduct of the lessee. He is bound, therefore, to keep the soil in a proper state of cultivation, to preserve the timber and to support and repair the buildings." This is an elementary statement of the law requiring a tenant to reasonably maintain a proper condition of whatever portion of real estate he may have leased.

The lessee is not bound to make substantial, lasting or general repairs, but only such ordinary repairs as are necessary to prevent waste and decay of the premises. (*Suydam v. Jackson*, 54 N. Y. 450.)

If a window in a dwelling should be blown in, the tenant could not permit it to remain out and storms to beat in and greatly injure the premises without liability for permissive waste, and if, in time of rain, a shingle or board in the roof should blow off, the tenant could not permit the water to flood the premises and thus injure them without a similar liability.

On the other hand, a landlord, in the absence of an express agreement, is not bound to make repairs, nor to pay for those made by the tenant, nor to rebuild in case of partial or total destruction. And a promise made by the landlord pending the term, to repair the premises, if without consideration, is of no avail.

If a property is leased for a definite term, under a single contract which contains no covenant that the premises are in good repair, or tenantable condition, or that the lessor will put or keep them so, the law does not imply

a covenant on the part of the lessor that the property is without inherent defects rendering it unfit for residence, nor that, if it is so, it will continue so through the term. This rule applies also to the presence of vermin, offensive odors, etc.

The maxim "caveat emptor," that is—let the buyer beware—applies and the tenant takes the risk of quality and condition unless he protects himself by an express agreement.

If the landlord has bound himself by the lease to make repairs, or to rebuild, and refuses or neglects to do so, after reasonable notice, the lessee may make them and charge the necessary expense to the landlord.

But if there is no special agreement between the landlord and the tenant on the subject of repairs, the latter cannot charge the expense of repairs made by him to the landlord.

If the landlord has covenanted to repair, and has failed to perform, but the premises are not thereby rendered uninhabitable, the tenant cannot vacate the premises and thereby terminate his liability for rent. He has three remedies: (a) to make the repairs himself, or (b) to withhold rent, and when sued set up his damages as a counterclaim, or (c) to bring action for damages.

There is many times a question as to the landlord's right to enter premises leased by him. If the lease provides that the landlord shall, or may, repair, etc., there is an implied permission that he may enter premises for that purpose. But in the absence of such provision, the landlord has no right to enter on the premises without the permission of the tenant, unless upon some default of the latter and under authority of law. If the tenant has covenanted to make repairs, and defaults, and abandons the premises, the landlord may make the repairs and recover both the expense thereof and also rent for the period succeeding the abandonment. So he may repair at the expiration of the term, if the premises are not left as agreed, and may hold the tenant for the expense.

A tenant, particularly when in for a long term, frequently improves the premises. This is sometimes done under a permission conferred by the lease and a provision for some form of compensation to the tenant, either in the form of money, or a renewal of the term, or otherwise. But where a tenant for years makes improvements on his own responsibility and for his own benefit, he has, apart from any provision of the lease, no claim against the landlord for their value.

By the covenant of quiet enjoyment, whether express or implied, the lessor undertakes two things: first, that the tenant shall not be evicted by one lawfully claiming under a valid paramount title; and, secondly, that the lessor will not do, or cause to be done, anything by means of which the tenant will be prevented from using the premises for any intended lawful purpose to which they could or might have applied at the time of the letting.

The general rule is that eviction is necessary to constitute a breach of the covenant of quiet enjoyment, for the covenant extends to the possession and not to the title, and thus is broken only by an entry and expulsion from, or some actual disturbance of the possession of the tenant.

There are circumstances which may justify the tenant in abandoning the premises, and which, in connection with the abandonment, will support a defense by the tenant of eviction by the landlord, although there was no actual entry, or physical disturbance of the tenant's possession. But there can be no constructive eviction without a surrender of the possession, and

before the tenant can successfully set up eviction he must have given up possession.

It is not every trespass by the lessor upon the demised premises which will amount to a breach of the covenant for quiet enjoyment. Although the covenantor cannot avail himself of the subterfuge that his entry was unlawful, and he, therefore, a trespasser, to avoid the consequences of his own wrong, still to support the action of the covenant, the entry must be made under an assumption of title.

As a general proposition, if a tenant holds over, or continues in possession of the demised premises, after his term has expired, the landlord is entitled to hold him liable for a further term. In order to have this effect, the holding over must be a continuance of that possession which he acquired under the lease, as, for example, where all the tenant's property remains upon the premises after the term has expired, in the same condition as before. In such a case such occupation may constitute a holding over as matter of law. But unless there is a continuance of the possession acquired under the lease, there is no holding over such as to bind the tenant for a new term.

The fact that the tenant does not formally "surrender" the premises does not constitute a holding over. It is a sufficient surrender if he move out at the end of the term. His time is up and he departs, carrying his property with him, and this is all that he is required to do. But in order to warrant a forcible ejection of a tenant from the demised premises, on the ground that he had made a surrender, an actual delivery of the premises by him to the landlord is essential. A mere agreement to surrender is insufficient and a mere holding over does not justify a forcible entry and ejection by the landlord without process.

Where a tenant for a year, or for one or more years, holds over after the expiration of his term, the law will imply an agreement to hold for another year, upon the terms of his prior holding so far as applicable. The same principle has been held applicable to a monthly hiring, or to a hiring for eleven and one-half months; in which cases the result of holding over would be to continue the tenancy for another month, or for another term of eleven and one-half months, respectively.

The option to regard the act of the tenant in holding over, either as a trespass or as establishing a leasing for a further term, is with the landlord and not with the tenant; the latter holds over the term at his peril. And the fact that the tenant had previously notified the landlord of his intention not to remain for another year, and that he has hired other premises, is immaterial, and does not diminish the landlord's right to hold him to the legal effect of his actual holding over. But the holding over puts the landlord to his election; he must either accept the tenant as a tenant for a new term or treat him as a trespasser; he cannot do both.

The fact that a tenant's holding over is not voluntary and for his own convenience, but involuntary, though avoidable, is immaterial. Thus, it is no excuse that the tenant, having violated her covenants by sub-leasing the premises for a boarding-house, found it impracticable to engage trucks to move on the last day, and that on the next day a sick boarder could not be moved with safety, and was not moved until the day following.

And if the tenant sublets the premises, and the sub-tenant holds over the term of the principal lease, the original tenant becomes bound thereby to the landlord, with the same effect as though he had personally held over.

And the same principle applies to bind an assignee of the tenant if the assignee's sub-tenant holds over. If a sub-tenant holds over and thus binds the tenant for another year, the landlord who collects rent from the sub-tenant is liable to pay over to the tenant any excess above the principal rent.

The lessee of premises acquires by the lease, subject to its covenants and certain restrictive principles, the right to exercise and enjoy all privileges belonging to the owner thereof as such, which he might have exercised and enjoyed by virtue of his ownership of the premises if he had not demised them, as to make such erections, improvements and additions as may contribute to profitable employment, which are not prohibited by the terms of the lease and do not constitute waste.

The rights of a tenant as against the lessor's mortgage or a purchaser of the foreclosure sale depend, in the first place, upon the question whether the lease was executed first, and so the tenant in possession is unaffected by the mortgage, or whether the mortgage was executed first, and so cannot be prejudiced by a subsequent lease by the mortgagor. And even though the mortgage is prior to the lease, yet the tenant is not bound by the foreclosure unless he is brought in as a party.

In the absence of any special provisions in the lease, the tenant of a floor in a building leased for business purposes may in general use the outer surface of the wall constituting part of the premises demised to him for advertising purposes, and to that end may cause to be painted or displayed thereon appropriate and inoffensive pictures, signs, and other devices, or, it seems, may suspend his wares thereon if no one is incommoded thereby.

But his right in these respects must be exercised within the limits of his duty not to work any permanent or material alteration in the building in derogation of the right of the reversioner at the end of the term. In addition, his rights are governed by statute, local ordinance and the terms of his lease.

Unless the landlord has by covenant or otherwise bound himself to keep the demised premises in repair or in other respects in safe condition, and has failed to do so, or has, in fact, rendered himself liable by some culpable negligence, as in the performance of repairs or alterations, which he has undertaken to make, or has misrepresented the condition of the premises, or concealed danger, defects or nuisances, known to him, or of which he was put on notice, at the time of the letting, and not apparent upon inspection, or leases premises with a nuisance thereon, which continues after the leasing, or leases for a use which continued will constitute a nuisance, or is guilty of a trespass not constituting a nuisance, he is not liable for injuries resulting from defective or improper condition.

It is not the general rule that the owner of land is, as such, responsible for any nuisance thereon. It is the occupier, and he alone, to whom such responsibility generally and *prima facie* attaches. The owner, however, is responsible, (1) if he creates a nuisance, and maintains it; (2) if he creates a nuisance, and then demises the land for rent with the nuisance thereon, although he is out of occupation; (3) if the nuisance was erected on the land by a prior owner, or by a stranger and he knowingly maintains it; (4) if, in certain cases, he has demised premises and covenanted to keep them in repair, but omits to repair, and thus they become a nuisance; (5) if he demises premises to be used as a nuisance, or for a business, or in a way, so that they will necessarily be a nuisance. But an owner who

has demised premises for a term, during which they become ruinous, is not responsible for the nuisance unless he has covenanted to repair.

With all due apology for broaching the subject myself, I wish in conclusion to offer a few words about the relation of the lawyer to the manager. I believe I may with all propriety suggest that the manager will do well to pay a competent attorney a fairly ample retainer in consideration that the attorney become a portion of the working organization of the building and be at the helm whenever needed. There are countless apparently insignificant matters which should have the close scrutiny of a good legal mind, and the manager should have at call the advice and suggestion of a lawyer. It is just as economic as hiring a carpenter or plumber. Notwithstanding its importance, however, many managers think it sufficient to advise with counsel only when the urgency of the situation demands, and they present complications which might have been avoided by timely suggestion and advice. In addition, there is a certain gratifying sense of security and confidence which pervades the manager's efforts when backed by sound legal counsel that well repays the cost. Perhaps this is an ill-timed suggestion, since those who do not keep in touch with their counsel provide more retainers for lawyers by their unintentional mistakes, but to my mind the advice is sound and productive of greater harmony and real justice.

Be cautious and fair, but when your rights are infringed possess yourself of sufficient decision to enforce your rights through the medium of the law. By so doing you will command enviable respect and wholesome fear.



The Ninety-nine Year Lease

By Alexander S. Taylor

TWENTY-FIVE years of activity in the general real estate business has shown me that the operation of 99-year leaseholds has done more than any other feature of the real estate business to develop, expand and solidify the business section of Cleveland.

It has proved most advantageous and remunerative to the brokers handling the transactions, as well as to the lessees who have operated under this plan. Its possibilities and benefits are so far-reaching and within the grasp of every active real estate broker who is alive to his opportunities that I urge a careful study of the possibilities that are presented through this line of work.

The history of ground leases dates back to former countries. They were first operative in England, where extensive land-owners receiving grants from the Crown, desiring to perpetuate their ownership and a sure income from their lands, entered into long-term ground leases, the greater portion of them being for a 99-year period, some renewable forever. In the city of London the larger percentage of land, both in the business and residential section, is under long-term ground leases. In the older sections of the city lands are held by the old and wealthy families, who, with the income derived from this form of absolutely safe investment, are living in ease and luxury, one of the most notable examples being the Duke of Westminster, who at the present time, through the sagacity of his ancestors, has 99-year leaseholds expiring on some of the most valuable lands in London, many of them now being on their second period; and it is easy to imagine the fabulous increase in his ground rent based on the new valuation. There the fee of property is seldom sold, the operations being on the leasehold rights of the lessee.

In the settlement of America the early English settlers first populating the states of Maryland and Pennsylvania were of the wealthier class, and introduced the custom of long-term ground leases into this country, their earliest history being in the cities of Baltimore and Philadelphia, as early as 1817.

The settlers of New York, being Holland Dutch, were not familiar with the operation of ground leases, nor were the poorer classes of English people who first settled the New England states, their experience having been that merely of tenant in their own country.

The meaning of the term "99-year lease" is often asked, and why ninety-nine years rather than any other fixed period should have been adopted. From what I can determine such an expression is merely intended to indicate a form of lease which early became most common in England. It is evident that at one time they had a statute in England which placed certain restrictions providing that a lease should not be taken for a 100-year term or more, so that this being the longest term allowable the same was adopted

and the restriction against a longer term practically nullified by provisions in the lease amounting to contracts for renewal, sometimes for fixed periods and sometimes forever, there being apparently no statute to interfere with such stipulations for renewal.

The ordinary lease is a contract for the possession of land and tenements, in consideration of the payment of rental therefor. In every lease there must be a lessor capable of granting the land, a lessee capable of accepting the grant, and property capable of being granted. The rent payable under the lease may be in money, services or anything of value, which is the subject of sale or transfer.

A 99-year leasehold is merely an extended form of lease containing clauses and provisions for the safeguarding of the interests of both the lessee and lessor, and providing additional clauses of agreement which will care for future conditions beyond the life of the present parties to the lease.

The wording of clauses in a 99-year lease are framed according to the requirements to be met. In almost every lease there is some special feature to be embodied, so that it is difficult to find a form which will adapt itself to all purposes. Often the parties to the lease use some form that is a matter of record and copy verbatim the provisions, with the result that some important features are left out of their lease, which should have been embraced, leaving cause for misunderstanding and legal construction at a future date. I would strongly recommend the preparing of a form by a competent attorney experienced in such legal documents, and to leave no opportunity for future generations to doubt your wisdom and business ability.

While the forms of 99-year leaseholds differ, yet the principle is quite the same, and the clauses identical in purpose. I shall treat my subject by presenting it in three parts:

First. The form of leasehold.

Second. The purpose.

Third. The benefits.

I recommend a brief and concise form of lease, with terms not ambiguous, but easily interpreted, and with no sections or clauses which may seem to be in any way conflicting. In preparing a long-term ground lease, they should be made in duplicate, the original and the counterpart; the form should contain:

1. Where the lease is made, and the date.
2. The parties to the lease, the lessor and lessee, or first and second parties, giving names in full. If a corporation or partnership, it should be so stated.
3. The covenants to run with the land, should be binding on parties to the lease, their heirs, executors, administrators or assigns, as is written after the words lessor and lessee in each instance.
4. A statement that the lessor or first party leases to the lessee, or second party, certain lands or tenements.
5. Accurate description of the property, by metes and bounds or by recorded plat, as complete as possible.
6. Give the terms of the lease, from date of beginning to expiration.
7. A clause covering the rights of present tenants or unexpired leases, if any, to be assumed by lessee.
8. The rent agreed upon, with terms of payment, stating specifically whether a fixed rental or revaluation.

9. Clause covering payment of taxes, both general and special, together with all legal assessments, whether now a lien or hereafter levied, beginning with the taxes dating from the term of the lease.

10. Clause covering the payment of rent, in gold coin or its equivalent.

11. Clause covering provisions for future taxation on ground rents to be paid by lessor or lessee. At the present time such ground rents are so far as can become taxable only in operation in the State of New York, on leases extending over a period of twenty years.

12. A clause covering the lessee's agreement to comply with all the laws and ordinances affecting the premises.

13. Clause covering the liability and protection of lessor against claims for damages through legal action.

14. Clause covering building to be erected, the cost, type, and the matter of keeping the same in repair and proper condition.

15. Clause covering the bond required pending the erection of the building.

16. Insurance clause protecting lessor by insurance to the value of 60 to 75 percent against fire, and the depositing of the policies with agreed trustee, and agreements after the adjustment and payment of fire loss, for the application or distribution of the money; also clauses covering the rebuilding, the time when construction shall commence and be completed, and forfeiture clause for nonfulfillment.

17. Clause covering selection of trustee, as holder of policies, and party to whom loss shall be made payable, and suitable provision for securing new trustee in case original trustee retires or refuses to serve, which is ordinarily, in case the parties fail to agree on the appointment, done by some designated court selecting, within a limited time, another trustee.

18. Clause covering labor claims and mechanics' liens, requiring the premises to be kept from the same by lessee, and in case of dispute that the same be paid within ninety days after declared a valid lien by the court of last resort. Such claims, generally speaking, only operate as liens on the interest of the tenant, but in the State of Ohio and possibly elsewhere there have been attempts made to also give the liens on the estate of the lessor.

19. Clause providing where rental shall be paid, and notice by lessor to lessee in case of change of place of payment.

20. Clause covering the conditions upon which an assignment of the lease can be made, which should specifically provide that no assignment shall be valid unless all lessee's engagements for the past have been performed, and unless those to be performed in the future have been expressly assumed by the assignee and evidence of such fact has been given to lessor. If the lease requires the construction by the tenant of a building of substantial character on the property, it is a common provision that upon the assignment of the lease after said construction, the lessee, if not otherwise in default, shall be relieved from personal liability on the covenants of lease, the lessor looking to the assignee and to the improved condition of the property as their security for the payment of the rents.

21. Clause giving the lessee right to alter and destroy building, and erect another under specific time agreement on giving proper bond, naming amount and cost of new building.

22. Clause giving lessor the right to possess premises on failure of lessee to carry out agreements, and covering the forfeiture of improvements.

23. If required, clause covering the mortgage, with agreement that certain proportion of rent be deposited with trustees to meet mortgage obligation.

24. Clause covering the disposition of the improvements at the expiration of the term of the lease. Some leases provide that at the expiration of the term, all buildings and improvements erected upon the leased premises shall be surrendered to the lessor, but it is now becoming the common practice, at least in the city of Cleveland, to make this clause more equitable to the lessee.

As I shall show hereafter, I think that it is quite as much to the interest of the lessor as to that of the lessee that provisions be made in the lease for some equitable recognition and payment to the lessee of the amount that the buildings and improvements standing upon the leased premises at the expiration of the lease, add to the value of the land. In most of the leases now drawn, provision is made that at some time during the last year of the term, an appraisement shall be made of the land, and of the buildings and improvements, separately. For the protection of the lessor, it is frequently stipulated that the value of the improvements so fixed shall in no case be more than the amount that such improvements enhance the value of the land, the usual clause being that the appraisers shall fix, first the value of the land without the improvements, and second the value of the land with the improvements, and that the difference between the two valuations shall be taken as the value of the improvements.

It is usual to provide that after the appraisement has been made, the lessor shall have the option for a certain time to purchase the improvements at the expiration of the lease by paying the value thereof as determined by the appraisal. In some leases it is provided that in case the lessor does not elect, within the time therein provided, to purchase the improvements, the lessee shall have the right to purchase the land at the appraised value. In other leases, provision is made that in case of the lessor's refusal to purchase the improvements, the lessee shall have the right to take an extension of the lease, either for the further period of ninety-nine years or for some lesser period, the rent during the extended term to be at a certain rate based upon the appraised value of the land.

Another clause used in some leases provides that in case the lessor shall not elect to purchase the improvements, the lessee and lessor shall become tenants in common in the entire property in proportion to the appraised values of the land and buildings, and that they shall exchange proper conveyances so as to vest in each party the fee simple title to his proportionate interest in the entire property including lands, buildings and improvements. The result of such a clause would be that in a case where the land was appraised at \$100,000 and the improvements at \$50,000, the lessor would, at the expiration of the term and in case he failed to elect to purchase the improvements, become the owner of an undivided two-thirds interest of the entire property and the lessee would become the owner of an undivided one-third interest in said property.

25. If privilege of purchase of the leased premises is a part of the agreement, a clause fixing a time for exercise of the privilege and giving amount of purchase price and terms of payment.

26. Liquor clause, to cover any agreement embraced in the negotiation preventing the use of the premises as a place for the sale of intoxicants.

27. Forfeiture clause, if rent is not paid within a fixed time, varying in

different leases from sixty days to six months, ninety days as a general rule.

In conclusion, the lease should be signed and executed before a proper authority, witnessed and a notarial seal affixed, as in a deed or mortgage. A full abstract of title should be furnished by the lessor and carefully examined by the lessee, or his attorney, that all liens and incumbrances on the property may be noted and provided for under the agreement, before executing the instrument. Upon the completion of the execution of the lease and the delivery of the bond, one copy of the lease should be made a matter of public record.

The lessee should furnish proper bond covering the amount of the cost of the building, and the carrying out of the building clause. There is no regular printed form of bond of this character; they are all written practically to cover the conditions of the lease, reciting the particular conditions required. The charges by the regular bond companies require a payment of ten dollars per thousand per annum; as in the lease, the conditions vary in the bond.

The matter of the amount of rent agreed to between the parties to the lease should be the result of careful negotiations based upon the present worth of the property and upon the ability of the lessee to meet the obligations and carry forth the terms of the agreement. The revenue is known as ground rent, a certain agreed sum of money which the grantor of the land reserves to himself to be paid at regular periods out of the land conveyed by lease.

Any valuation based upon present facts and conditions alone, is not complete, due consideration of past influences and future prospects being necessary to determine the worth of the land, and those should be thoroughly considered by the parties entering into the lease. The purpose of 99-year leaseholds on the part of the lessor is the entailing of his property rights and interest through leasehold, as the safest and surest way of providing an income for himself and the generation to follow. The lessor on making his will often provides that the fee shall not be sold, but held in trust by some responsible trustee, with authority to pay over to designated heirs certain sums from ground rents sufficient to provide them with a comfortable maintenance. Many trustees of estates and investors seek the fee under ground leasehold, believing it is the safest form of investment where the property has been improved by lessee, with care and due consideration to the section. I believe that an option to purchase clause, at an agreed figure, during a fixed term of years, adds greatly to the value and negotiability of the leasehold, it being easier to secure a loan on the lessee's interest if such a clause is embodied in the lease; while a fixed purchase price is generally placed at an amount in advance of the present market value of the land, it is proved that the improvements placed thereon and the changing of the property by improvements to a higher class has stimulated an advanced land value which will accrue to the lessee under his purchase clause, but which would be of no advantage unless this clause was available.

A straight term leasehold at an agreed rent is the safest and has proven the best. Reappraisal leaseholds have proved cumbersome and unsatisfactory. The improvements placed on the land vary in accordance with the ideas and requirements of the lessee, but should be from one-fourth to one-half the value of the land. Liquor clauses are both beneficial and detrimental. My experience tells me that liquor privilege clauses should not be inserted

in a leasehold where property is in the best retail section, the keeping out of such clauses enhances the value of the land and if generally adopted by all property owners in that section retains its high class retail possibilities and value for a longer period.

The natural growth of cities, with increasing land values, has made the conservative operation in leaseholds in the business section the safest form of speculation in real estate, for those of limited means. In many of our larger cities, where leaseholds are in effect, a large percentage of the business section is under lease. That this percentage will grow is evidenced by its success, and I believe that 99-year leaseholds are really in their infancy. I contend that there is as much science in the study and operation of land and its development as in medicine and other professions. Scientific land development is in its beginning, and scientific principles should be adapted to land development and operation as they are applied to any other valuable commodity.

The effect of 99-year leaseholds has shown a most substantial development in sections which have been improved in the city of Cleveland through this method of operation. The erection of fine buildings of a better class has had much to do with our rapid business expansion and growth. As in most cities the finest retail development follows the best residential development, so where there is the highest rental from business property we find the best retail section patronized by women from the highest class residential section.

You are quite aware that in all of our cities we find in the business and mercantile sections old homesteads entirely surrounded by business development, the owners of which properties occupy them and keep them for sentimental reasons. They are unwilling to part with the fee and unable to improve the property in keeping with the surroundings. You will find, however, that these owners are quite approachable with a proposition to lease their property for a long period, where their interests are properly safeguarded and where they receive an assured income. Sentiment alone has prevented them from disposing of their property. We do not take away from them that sentimental interest; they still retain their fee and generally yield to the proposition of a long leasehold, if presented in a proper and logical manner, and with a lessee financially and morally responsible, capable of carrying out the provisions of a lease. The erection of a building immediately enhances the value of their land, and the owner is more secure in his investment than if he had erected a building on borrowed capital, which might be subject to long vacancy or mismanagement. We now find the lessor content with his fixed income, secured by valuable improvements, or by a bond guaranteeing them, and the lessee content with the property upon which he erects a building according to a defined plan and purpose.

At the present time rents for a fixed period in sections where values are advancing, are estimated at five and six per cent on a valuation somewhat higher than the present staple value of the property. In other sections, the rents are generally based on a like percentage of actual salable value. It is customary to give the lessee a rebate of one-third to one-half of the first year's ground rental, where lessee constructs building during the first year's period of the lease. The commission receivable from the sale of the property based upon the standardized rates of commission of the city, applies to ground leaseholds, the commissions being based on a valuation of a five percent income and payable out of the first year rents. In reality

a 99-year leasehold is a transaction by which the lessee acquires the property of the lessor in the ownership, and borrows from the owner the full value of the property for a fixed period at an agreed rate of interest, with no fear that his loan will be called, providing he pays the rental agreed as interest. It means that an investor with limited capital, seeking high class property as a location for a building, requires through leasehold only one-third to one-half the capital necessary for the completion of his plans through outright purchase. Through leasehold he secures land without cost excepting interest charges and taxes, and uses all his capital for the improvement, having the landowner virtually as a partner in his enterprise. In our city not many young active men have money to purchase outright land required, but by securing a lease they are able to secure a safe, although sometimes speculative investment, which if wisely chosen advances in value rapidly.

In modern times when anybody starts out to inaugurate some enterprise it becomes most important to finance it to the very best advantage. By judicious selection of property in the pathway of business expansion, the lessee is able to secure on a fixed rental leasehold containing a purchase clause, a loan of fifty percent of the value of the improvements. As an example of the benefits to the investor or lessee, assume that he has but \$50,000 for his total investment, instead of being obliged to purchase land at the value of from thirty to fifty thousand dollars, and have but a proportion or none of the remainder left for improvements, he is able to lease a property of the value of fifty thousand dollars, and place his total amount of cash in buildings which will yield him a larger proportion of revenue, and create an increment on his leasehold value, due to the erection of a higher class of building, which naturally stimulates activity in that section, and enhances the value accordingly.

It is wise for the lessee to secure occupants for the building before entering into the lease. No one can forecast the future development of the section beyond a limited time, and caution should be used in selecting the locality of a particular property and agreeing to pay a fixed rental, unless the property carries itself or can be immediately developed and treated as an investment proposition. Great caution is necessary in leasing in sections where development is drifting and values are not due to real business expansion. The tendency of the optimistic real estate operator to anticipate values in advising his client is one to be carefully guarded against.

The most successful leaseholds to the lessee are those in which he has first worked out a definite plan of action, has arrived at a comprehensive cost of the building to be erected, and secured tenants to occupy the premises at a rental which will cover the ground rental and taxes. The operation of a successful business in the building naturally enhances the value of the property, adding the increment to the lessee's interest.

Great care should be exercised in the erection of a building covering land where separate and adjoining parcels are under lease to one lessee from more than one lessor. Arrangement of the building, wall and columns should be made so that the units of space are properly divided proportionately over the line of the respective ownership. It is a regrettable fact that years ago a lessee in the city of Cleveland in acquiring two adjoining properties through leasehold, erected his building as one unit in such a manner that the columns carrying the structure were not so spaced that the buildings, if divided, would be in sections of uniform width. Through financial difficulties the lessee defaulted on one of the parcels of land, and

one lessor was obliged to take over that portion of the building covering his property. The entire building was unfortunately so divided that this portion covered by the separate lease was not tenantable without the placing of a partition wall so close to one row of columns as to deprive the property of some of the value which its frontage on the street would have given it had it been constructed with reference to such frontage.

I recall a number of instances in Cleveland where the interest of the lessee is more valuable in a leasehold right than that of the lessor, or owner of the fee; notably a property on Euclid avenue and East Ninth street, where a 99-year leasehold was made in 1887 at \$6,000 per year for a fixed term of ninety-nine years. The land has advanced in value so far beyond the anticipations of the owner or lessee, that today the lease is worth at least one million dollars. I understand the fee cannot be purchased for less than five hundred thousand dollars, although in reality it yields but five percent interest on \$120,000.

Another example of profit is on 110 feet on Euclid avenue east of Ninth street, which I leased in 1906 for \$16,000 for the first 9 years, \$18,000 for the next 2 years, and \$20,000 for the balance of the term. I recently offered the lessee a rental of \$32,000 per year net for the property, or six percent on \$200,000 profit, or five percent on \$240,000 profit, or could have secured \$200,000 in cash for the leasehold. This was refused. It was truly a handsome profit for a few years' possession of a property which has almost carried itself by rents received during that period. There are instances upon instances where great profits have been made in acquiring 99-year leaseholds, and where some of the largest commissions ever paid to brokers have been received. A number of the finest office and mercantile buildings and a hotel in Cleveland are on ground leases. The new Statler hotel, erected at a cost of more than two millions of dollars, on land at the corner of Euclid avenue and East Twelfth street, at a fixed rental of \$32,500 per year, is one of the recent acquisitions under ground leaseholds which I have made. A million dollars on bond issue was borrowed by the lessee toward the erection of this building, the remainder being supplied through the sale of preferred and common stock, the proceeds from which went into the erection of the building before the million dollars borrowed from the banks and trust companies on bonds followed.

One notable lease of unusual character is known as the Cleveland "sky lease." I believe this lease to be the only one of its kind in existence in the United States. A magnificent 14-story structure, the home of the Cleveland Athletic club, and some of Cleveland's largest retail stores occupy the building. The frontage of 150 feet on Euclid avenue was leased for a straight term of 99 years at \$28,000 per year net, with an option of purchase clause. The lessee immediately erected a 6-story building with foundations strong enough to carry several additional stories. After completing the building he leased the air space above the sixth floor, and the support of the walls and columns of the lower structure, to the Cleveland Athletic club for the balance of the term of the original lease at a rental of \$16,000 per year, and the club immediately completed a seven-story addition to the building at a cost of more than half a million dollars. This rental included entrance for elevators to the top building, and some space in the basement. The Athletic club pays a fixed annual rental. It pays no tax on the land, but on a portion of the building erected by it. At the termination of the lease the owner of the fee agrees to pay the appraised value of the improve-

ments, or extend the lease for another period of years. In case of failure of the original lessee to carry out the terms of the underlying lease, the Athletic club is secured through an option to assume the original lease.

By studying carefully the marked path of business expansion the lessee can always be safe in his investment. I have always been impressed with that well-thought-out statement of Richard N. Hurd in his book, "The Principles of City Land Values," where he states that the "growth in cities consists of movement away from the point of origin in all directions except as it may be topographically hindered, this movement being due both to aggression at the edges and pressure from the center. Central growth takes place both from the heart of the city and from each sub-center of attraction and axial growth pushes into the outlined territory by means of railroads, turnpikes and street railroads. All cities are built up from these two influences, which vary in quantity, intensity and quality, the resulting districts overlapping and interpenetrating, neutralizing and harmonizing as the pressure of the city's growth brings them in contact with each other, the fact of vital interest being that despite confusion from the intermingling of the utilities the order of dependence of each definite district on the other is always the same. Residences are early driven to the circumference while business remains at the center, and as residences divide into various social grades retail shops of corresponding grades follow them, and wholesale shops in turn follow the retailers, while institutions and various mixed utilities irregularly fill in the intermediate zone and the banking and office section remain at the main business center. Complicating this broad outward movement of zones, axis of traffic project shops through residence areas, create business sub-centers where they intersect and change circular cities into star-shaped cities."

Bearing this in mind you can with safety advise the lessee in the selection of property, knowing that if a definite plan is followed on a location within the pathway of business expansion, and the lessee keeps within his financial ability he will be successful.

One of the most satisfactory liquor clauses that I have ever seen embodied in a lease, provides against the sale of intoxicating liquors, at retail, except as the same may be sold in connection with a hotel, restaurant, drug store, or other kindred business, to which such a sale of liquors shall be incidental merely, and shall not in any case suffer or permit such liquors to be sold or dispensed over a bar, except in connection with the use of the premises for the purposes of a hotel as the principal business, and that no main entrance to such place shall be located upon the street upon which the property fronts.

I am indebted to Honorable J. M. Henderson, one of Cleveland's representative and foremost real estate lawyers, for legal advice in the preparation of this article. He advises me that one of the most beneficial provisions of a lease is the one which secures a very full measure of payment to the lessee for buildings which are on the premises at the expiration of the lease. Many lessors are in this respect short-sighted and unwilling to assume that kind of an obligation for full payment for buildings, which is absolutely necessary if the buildings are to be kept in the best possible condition throughout the term or replaced if they are out of date. Nothing will depreciate the value of a city lot more rapidly than to have old, out-of-date buildings upon it or in its vicinity, and as long as the landlord is unwilling to make full payment for structures on the land at the expiration of the

lease, it will generally be to the tenant's interest to let the buildings run down and never to replace old ones with new during the later years of the term.

The effect of allowing old or ruinous or out-of-date buildings to remain on the land, is to depreciate the value not only of the particular lot, but of the adjacent or contiguous lots by driving business into more attractive sections, and if there are a number of buildings in any particular section which are thus allowed to become unattractive as business places, it is very certain that business will go elsewhere.



PART III

Accounting and Reports

System of Comparison Records

By C. M. Duncan

IN a little book that came to my desk I found this statement: "It has been well said that the average business executive fails to get more than a small fraction of the vital facts and figures that he should have to intelligently control the activities of the business."

Bankers and mercantile agencies tell us that more business men fail because of ignorance of the true condition of their affairs than for lack of ability and enterprise. The writer just quoted further asserts that "the desire to dodge the expense and trouble of the necessary system that would bring such vital statistics to the executive's desk has created this condition." A survey of most any field of enterprise would disclose the dominant positions occupied by the concerns whose executives first realized the value of shaping their policies and basing their lines of action not upon inspiration or guesswork, but upon definite, accurate information of the various phases of the business under their control.

Whatever may be the attitude of the majority of our profession, the men who are responsible for the success or failure of the building enterprises of the country, it is certain that in no other field of business activity is it more important for the managing executive to know where he stands every minute of the time.

Very shortly after assuming the management of the State Bank Building in Little Rock, Ark., I found myself most uncomfortably hampered by the meagerness of statistical information afforded by the accounting methods then in force, and I immediately set about devising a system of accounting that would yield the information required for the intelligent direction of the business.

A certain accounting authority defines an efficient accounting system as "an orderly and logical arrangement by simple processes of the facts and figures of the business so that it may concentrate into clear and concise statements a complete expression of the activities and conditions of that business." This concentration into concise statements is the subject with which I have to deal.

The "complete expression of the activities and conditions," in case of the State Bank Building, is brought before the manager each month in the shape of ten reports, enumerated as follows:

- A statement of the rental income.

- A statement of occupancy.

- A comparative condensed balance sheet.

- A comparative profit and loss statement.

- A statement of receipts and disbursements.

Four comparative analyses of operating expense in the four operating departments.

- A summarized analysis of operation expenses.

These may appear to you a formidable array, but I think that not one can be wisely dispensed with.

Statements of Occupancy and Rentals.

The statement of rental income is shown in Figure 1 herewith. It is a complete record of the movements of tenants into, out of, and about within the building, and the effect of these movements and changes on the occupancy and income. It is made up on the first day of each month. The statement here presented, dated May 1, 1912, shows that J. D. Jones is to occupy from that date room 601-2, under lease No. 601. This results in the addition of two rooms and 500 square feet to the number of rooms and the space occupied respectively; also an increase in rental income of \$55.00 over the month preceding. The same idea is carried out in recording removals.

STATE BANK BUILDING COMPANY				Rental Statement _____ 191__		
Lease No.	Rooms			No. Rooms	Area	Rental
601	601-2	ADDITIONS				
		J. W. Jones		2	500	5500

FIGURE 1.

Under the head "Changes" are recorded the transfers of tenants from room to room, changes in rent, etc. Thus, the totals under the heading "Additions" give the number of rooms and the area being occupied on the first of the month, and the monthly revenue to be derived therefrom. The totals under the heading "Removals" give the number of rooms and area vacated on the first of the month, and the decrease in revenue due to these vacancies. Changes may result in an increase or a decrease. The net

NOTE:- OCCUPANCY INDICATED BY LEASE NUMBER
VACANCY INDICATED BY IN RED.
OR SPACE SHOWN VACANT ROOMS 30 FT.
THE COMPANY. 2% OF TOTAL SPACE IS OCCUPIED BY

FIGURE 2.

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vertical line. The areas of the various rooms on the floor appear in the lefthand space. In the righthand space the occupancy or vacancy of each room is indicated by appropriate symbols. The condition of each floor is then summarized at the bottom of its column, giving the total, the rented and the vacant area in terms of rooms and square feet and the percent of each. Having the areas of the different rooms conveniently entered materially assists in this compilation. The same summarization is applied to the office space as a whole. From records of previous periods the increases or decreases over the previous month and the same month of the previous

STATE BANK BUILDING CO.		PROFIT AND LOSS STATEMENT- No. _____ 191__		
	THIS YEAR	LAST YEAR	NO. THIS YEAR	NO. LAST YEAR
INCOME				
9-11 FROM BUILDING RENTS				
9-12 FROM SALE OF CURRENT				
9-13 FROM SALE OF HEAT				
9-14 FROM SALE OF REFRIGERATION				
9-15 FROM SUNDRY SALES				
9-31 BAD ACCOUNTS COLLECTED				
GROSS INCOME				
001-2 DEDUCTIONS FROM INCOME				
NET INCOME				
EXPENSE				
NON-OPERATING EXPENSE				
001-11 GROUND RENT				
001-123 INTEREST-MISCELLANEOUS				
001-13 TAXES				
001-14 LEGAL EXPENSE				
001-15 INSURANCE				
001-16 TAXES PAID-UNDISTRIBUTED				
001-17 INTEREST ACCRUED 1911, PAID 1912				
001-19 MISCELLANEOUS				
001-3 DEDUCTIONS FROM SURPLUS				
TOTAL				
DEDUCT- ITEMS OF EXPENSE NOT PROPERLY CHARGABLE TO PERIOD				
TOTAL NON-OP EXPENSE FOR PERIOD				
OPERATING EXPENSE				
01- GENERAL				
02- BUILDING DEPT.				
03- ELEVATOR DEPT.				
04- JANITOR DEPT.				
05- GENERAL SERVICE DEPT.				
TOTAL OPERATING EXPENSE				
TOTAL EXPENSE FOR PERIOD				
EARNINGS BY OPERATIONS				
DEDUCT- INTEREST ON BONDS				
APPRO. TO REDEMPTION FUND RESERVE				
TOTAL				
NET PROFIT - PERIOD				
ITEMS OF EXPENSE NOT CHARGABLE TO PERIOD				

FIGURE 3.

year are noted. The basement and first floor space are treated separately in their proper columns, but are included in the grand summary, which shows the total rentable area, the total rented area, and the percent of rented area in comparison with the corresponding figures for the same month of the previous year. The total rented area as figured on the rental income statement described serves as a check against the figures obtained on this statement of occupancy.

Comparative Profit and Loss Statement.

The score card of the business game is the profit and loss sheet, and

your skill as a player is judged in the light of circumstances by the dollars and cents you are able to chalk up as profit on the right-hand side. In these piping times disastrous consequences follow so closely upon the heels of a misplay that it is not sufficient to total up the score once or even twice a year.

There are few businesses that would not benefit by an accounting system so designed that a complete profit and loss statement and a balance sheet could be drawn from the books every thirty days. This is a practice in our office.

STATE BANK BUILDING COMPANY											
Comparative Condensed Balance Sheet											
191 —											
ASSETS						This Year		Last Year			
1-10	Leasehold										
2-10	Cost of Building and Equipment										
2-101	Additions and Betterments										
2-102	Replacements										
3-1	Cash										
3-2	Notes Receivable										
3-3	Accounts Receivable										
3-4	Fuel-Material-Supplies in Store										
3-5	Expense Prepaid										
LIABILITIES											
4-10	First Mortgage Bonds										
4-20	Second Mortgage Bonds										
5-10	Notes Payable										
5-21	Audited Vouchers Payable										
5-22	Accounts Payable										
5-3	Expense Accrued										
6-10	Reserve for Redemption Fund										
6-20	Reserve for Depreciation										
7-10	Capital Stock										
8-10	Surplus										
	Balance				191						
	Net Profit				191						

FIGURE 4.

We have in use the comparative profit and loss statement exhibited in Figure 3. It really embodies four statements, covering the current month, the current year to date, and for purposes of ready comparison, the same periods of the previous year. The profit and loss statement is made up as soon after the first day of the month as the income and expense entries applicable to that month are on the books.

It would be useful here to outline the accounting methods applied to our property, but the time will not permit. In this connection, however, I must describe briefly our method of classification and distribution of income and

expense. It is generally asserted by accounting authorities that, in the development of an accounting system with the idea of making it yield statistical information, classification of income and expense is of prime importance. Once a system of classification is determined upon, it must be adhered to if comparative statements are to be of any value. Some

STATE BANK BUILDING COMPANY				Month of _____ 191__				
Comparative Analysis of				08-10 General Service Dept. Operating Expense				
	This Year	Last Year	Increase	Decrease	mo.		mo.	
					This Year	Last Year	This Year	Last Year
a Labor				a				
b Operating Maintenance & Repair				b				
c Extraordinary Repair				c				
Total Maintenance & Repair								
d Fuel-Coal-Boilers				d				
e " " Heater				e				
f " " Gas -Boilers				f				
g " " " Heater				g				
Total Fuel								
h Gas-Building Service				h				
i Electric Current-Power Purposes				i				
j " " Bldg. Service				j				
k Lamp Renewals				k				
l City Water				l				
m Lubricants-Waste-Packing				m				
n Misci. Supplies & Small Tools				n				
o Ammonia				o				
p Ash Disposal				p				
x Current Minor Const. & Alter.				x				
Remarks:								

Building rents,
 Sale of current,
 Sale of heat,
 Sale of refrigeration,
 Sundry sales,
 Miscellaneous,

and is classified accordingly. Each classification of income is represented by an account in the general ledger. They all appear under the head of "Income in the Profit and Loss Statement," and their total, together with any bad accounts collected, makes up "Gross Income." Any refunds or allowances that may arise are not charged direct to the income accounts on the books, but go into an account termed "Deductions from Income." On the statement the total of these deductions is taken out of the gross to give the net income.

In considering the matter of expense, an inspection of all the different

STATE BANK BUILDING COMPANY							
Summarized Analysis of Operating Expense for _____ 191__							
		This	Last		This mo.	Last mo.	
		Year	Year		Year	Year	
Departmental	a-Labor						
	b-Operating maintenance & Rep.						
	c-Extraordinary Repair						
	Total Maintenance & Rep.						
	d-e Fuel						
	f-g						
	h-Car-Building Service						
	i-Electric Current-Power						
	j- " " -Elg. Serys						
	k-Lamp Renewals						
	l-City Water						
	m-Lubricants-Waste-Packing						
	n-Miscel. Supplies & Tools						
	o-Ammonia						
	p-Ash Disposal						
	q-Rubbish Disposal						
	r-Elevator Uniform Service						
	x-Minor Const. & Alterations						
Total Departmental							
General Operating Expense							
Total Operating Expense							

FIGURE 6.

varieties of expense we had to meet discovered the fact that certain of these expenses were independent of the occupancy of the building, and would continue though the house be empty and idle, while others arose directly as a consequence of its operation and occupancy, though not proportionate to the extent thereof, and would immediately cease with the building emptied of its tenants and closed. Here, then, we may establish two groups:

Non-operating expense, including such items as taxes, insurance, depreciation, interest and the like.

Operating expense, including wages, material and supplies, bills for various sorts of outside service, maintenance and repairs, etc.

We arbitrarily separate the operating expense into two groups—general and departmental.

General expense includes the salary of the manager, office expenses, advertising, expense of night watchman and certain miscellaneous items.

The plan upon which our operating force is organized furnishes the basis for the distribution of departmental expense between the four departments. The distribution up to this point is made on the voucher register and each sub-division is supported by a general ledger account. The expense of each department is further subjected to an analysis, as will be shown later. The profit and loss statement shows for itself the way these various classifications appear.

Interest on bonds and appropriations to the bond redemption fund are, strictly speaking, non-operating expenses, but are treated separately as shown.

We have shown as a deduction from the total non-operating expense certain items of expense not properly chargeable to the period. This expedient was made necessary by the change from our old accounting system to the new, and is not of importance here.

If the comparisons between monthly periods in statements of this kind are to be of any value, it is important that each month of the year be made to bear its proper proportion of the year's expense. To illustrate this point in connection with non-operating expense, consider the case of insurance. Suppose premiums for a year are paid in advance in January to the amount of \$1,200. While this amount of money has been expended in January, we have yet to receive protection in return for it, and it is, in a sense, an asset. It should be charged to an account called "Insurance Premiums Prepaid," and \$100 transferred every month to the cost of insurance as an expense. Expenses of similar nature should receive like treatment. In the case of expenses such as taxes and interest, proportionate monthly accruals should also be taken into account. The yearly appropriations for depreciation or for retirement of bonds should be distributed in proportionate monthly quotas. It was formerly a practice in the State Bank Building to charge the cost of large lots of fuel, material and supplies direct to the operation accounts. This practice would destroy the value of comparative statements, and now a balanced inventory is maintained. The cost of consignments of supplies is charged to an account called "Material and Supplies." Issues are made only on requisition and the storeroom keeps an account of each department. The value of material and supplies used in any department in a month is charged up to that department at the end of the month from these accounts. Thus, the cost of material and supplies enters the operating accounts only as they are consumed.

The handling of coal on this principle is a more complicated proposition. We burn natural gas under our boilers and are saved any worry on this score. The bills for this fuel are rendered monthly and the distribution takes care of itself.

Statements of Receipts and Disbursements.

We have as yet no form for these statements. They are made up on a ruled multi-volume blank sheet such as is obtainable from any stationer. It is well to note that receipts are not the same thing as income, as we use the terms, nor is the expense for any period the same as expenditure. We speak of income in the same sense as the merchant speaks of sales, that is,

our income accounts include not only the amount we have actually received, but what we expect by virtue of the obligations of others in our favor.

Expenditures are made not only to meet current expenses, but for replacements, additions, betterments, and the like, and such expenditures are charged to property accounts. And certain items of expense accounts on the books represent accruals only, but not expenditures.

The Comparative Condensed Balance Sheet.

The form of Figure 4 is our Comparative Condensed Balance Sheet. You will note, among the accounts representing fuel, material and supplies, also the account representing prepaid expenses, expenses accrued but not due are carried as a liability.

Analysis of Expense.

There are some twenty-five accounts appearing on our general ledger, exclusive of the income and expense accounts. It was, therefore, thought unwise to complicate the general ledger entries by carrying the operating expense distribution into the general ledger further than to separate them on the departmental basis. The departmental expense accounts are analyzed monthly on four forms, of which Figure 5 is typical. This particular form is an analysis of the expense in the general service department, and shows our classification of that department's expense.

The expenses of the other three operating departments are analyzed on forms similarly ruled, but different as to classification. Expense in these departments is classified as follows:

Building Department Expense:

- a—Labor.
- b—Operating Maintenance and Repair.
- c—Extraordinary Repairs.
- d—Supplies and Small Tools.
- x—Minor Construction and Alterations.

Elevator Department Expense:

- a—Labor.
- b—Operating Maintenance and Repair.
- c—Extraordinary Repairs.
- i—Power.
- m—Lubricants, Waste, Packing.
- n—Supplies and Small Tools.
- u—Uniform Service.
- x—Minor Construction and Alterations.

Janitor Department Expense:

- a—Labor.
- n—Supplies and Small Tools.
- s—Rubbish Disposal.

These forms are designed to bring the items of the current month into comparison with the items of the same month last year, and columns are provided for entering the increases or decreases. The accumulated totals of the various items for the current year to date are also compared with those of the previous year. The different varieties into which the departmental expense has been separated are summarized in the form of Figure 6, and are subject to the same methods of comparison.

This is the summarized analysis of operating expense. Here the cost of labor, cost of maintenance and repairs, the cost of power and other varieties of expense in all departments are brought together into totals. You may have noticed certain figures and letters accompanying the captions of various accounts and classifications. These are symbols in the scheme of codification that embraces our entire system of accounts. We find them a great time-saver, especially in the work of auditing bills. One soon learns the symbols applying to the different accounts, and it is much more convenient, for instance, to write, "08-10b," meaning operating, maintenance and repair, in the general service department, than to extend the caption in full.



Systematic Records and Reports

By Whitney Wall

I BELIEVE that you would call my office a "central agency" for the management of buildings. I not only look after improved properties, but I also do a general real estate, loan and insurance business. I have in my charge several improved properties, but will confine this article to the office buildings, which are three in number.

Number one. A building which is located on a corner, ground floor space being 50x140 feet, and eight stories high, slow burning construction. The machinery consists of two hydraulic elevators with duplicate machinery complete, with sufficient boiler capacity to run said elevators and heat the building. The electric current for lighting of halls and engine room is bought from the Edison people, each tenant making his own contract with these people for his light.

Number two. A building which is located in the middle of the block, facing on two streets, and has a ground floor space 100x115 feet, six stories high on one street and seven stories high on the other. It has the same number of elevators and the same machinery as building number one, and the electric current is furnished in the same way as in building number three.

Number three. A building which is located in the middle of the block and fronts on two streets, and has a ground floor space of 50x115 feet, is twelve stories high on one street and thirteen stories on the other. This building is a thoroughly fireproof building, constructed of steel, with terra cotta floors and partitions. Its machinery consists of three elevators, three tubular boilers of 150 h. p. each; one Skinner engine of about 50 h. p., belt connected to a Three Rivers electric generator, 40 k. w.; one Skinner engine of about 80 h. p., direct connected to a Westinghouse generator, 50 k. w., and one small American Blower Company vertical engine of about 25 h. p., direct connected to a Crocker Wheeler generator of about 15 k. w. All of the engines and generators have been installed since I have taken charge of the building, which was about five years ago. In fact, all of the buildings and all of the machinery generally have been thoroughly overhauled and put in first-class shape. In building No. 3 we have the Armstrong flash signal on the elevators, and we do considerable outside heating and lighting.

When I took charge of these buildings they were all in a dilapidated condition, and tenants were paying about what they considered was right in the way of rent, and all of them were rented at a less rate than 50 cents per square foot, and about one-third vacant. Number 3 gave light free. Therefore you can readily see that they could not have been a paying investment. Without going into detail relative to the trouble and the worry a person has in building up buildings with a poor reputation, I will go right into the subject of blanks used in the operation of same.

First of all is the securing of tenants and in running three buildings from one central office, especially when the buildings are not of the size that will permit the employment of a superintendent in each building, it is absolutely necessary to have some sort of system whereby the central office will know what is going on during the day.

We have a blank for this purpose (of which we keep a carbon copy), which is known as a "permit."

No new tenants move in or old tenants move out or change offices; no carpenter, painter, electrician can do any work; no telephone can be installed or removed; no gas or electric meters installed or removed without a permit issued to the engineer or janitor, said permit being returned to the office the next day with notation on same if any damage was done. All telephone, gas and electric companies know that this permit is necessary and always call for it before starting any work.

After securing tenants, next comes the rent collection question, and I have found it good policy in a number of cases to make the rent a little higher than schedule so as to give a discount if said rent is paid before the 15th day of the month. As an example: Make your rent, say \$32.50 per month, with the notation that if said rent is paid before the 15th day of the month a discount of \$2.50 will be allowed. You can not charge a penalty because it would be usury, but you can allow a discount as large as you want. No one can complain of the plan because they are all expected to pay rent in advance, in fact agree to do so in their leases. If they complain, you can make up your mind they are poor pay, and you do not want them anyway. This method has saved us considerable trouble and loss of rent.

Relative to repairs, I have a blank which is issued to the man or department who is to make the repairs, telling what the repairs are that are to be attended to, the number of the office, and this is filled in with the name of the employe in charge of the work. After the work is finished, the tenant fills in the blank, after remarks, and signs his name. I then know that the work has been taken care of, that the tenant is satisfied with it, and when he comes to me a week or so afterwards and says that he complained about his door being out of order, his shades torn, and that he had reported same a week or two ago, I can, by referring to this blank, show him that the work was done, and that he had signed that it was satisfactory.

The next blank is a blank known as the rental ledger sheet, which is a loose leaf binding, and which I have used for the six years I have been in the office building business, transferring the sheets as soon as the tenant has left us to the transfer book, and therefore have a history of every tenant that has ever rented from me relative to his paying ability.

Now the elevator question. In the three buildings I have seven elevators and practically ten operators, as a janitor runs an elevator during the noon hour. I have no starters. The operators are supposed to be under the direction of the engineer, but as he is below most of his time and busy with other matters, he cannot watch elevators all the time. I have not in six years had an accident of any sort, but I have had complaints from tenants relative to conditions that they thought were unsafe, such as loose doors and other little things that might cause trouble if not taken care of. I would, on receipt of this complaint, immediately see the janitor and ask him why he did not report same. Of course he had reported it to some one in the office, or the engineer; in fact, every one, but it had not been fixed, etc., and I could not find any one who had heard of it. To correct this I now compel every one who runs an elevator to make a written report every night on the blank furnished for that purpose, and the operator has no excuse to offer, and in case he himself should meet with any accident he can not blame it on faulty machinery, loose doors, slack band cable

or anything else. It matters not how many elevators an operator runs, he is to make a report for each one.

Janitor Service.—We have a head janitor in each building. This man hires all other janitors, and he is held responsible for the appearance of the building, has charge of all supplies, does some repairing, and most of the painting. Janitor service costs us on an average a little less than eight cents per square foot of the rentable area, and this includes most of the labor for painting, all window washing, and all scrub women. Head janitor makes report. These reports contain: "Were any accidents reported or heard of about the building?" An employe might hear of an accident being talked of, not knowing the name of the person who was hurt.

The next blank is a report of the mechanical department, which is filled out by the chief engineer.

A report is made relative to the hours each piece of machinery is run. I have in my office a book called the machinery book, which gives a description, name of manufacturer, shop number of the machinery, and size of every part, and at the end of every month we put the number of hours that this machinery has been in service, and the number of hours it has been out of service. Then on another sheet, directly opposite this sheet, we have the repairs, if any, that were made to this piece of machinery, and the date and the cost of same, so that we know just what our machines are doing, and whether they are doing the work that is required of them, and whether they are being properly taken care of, because if a machine is constantly breaking down it is either receiving poor care or is of poor quality. This system is kept on all of our machinery.

ENGINE NO. 2 (Belted).

Duty	Run 40 Kw. Three Rivers Generator.
Manufacturer	Skinner Engine Co., No. 7300.
Horse Power	40 to 50.
Diameter of Cylinder	9 inches.
Length of Stroke.....	10 inches.
Revolutions per Minute.....	260 to 300.
Governor Wheel	Diameter 48 in.; Face 8 in.
Belt Wheel	Diameter 48 in.; Face 12 in.
Width of Belt	11 inches.
Diameter of Steam Pipe.....	3 inches.
Diameter of Exhaust Pipe.....	3½ inches.
Diameter of Crank Pin.....	4 inches; Length 2¾ inches.
Diameter of Cross Head Pin.....	2½ inches; Length 2½ inches.
Diameter of Main Bearings.....	3½ inches; Length 7⅞ inches
Width of Engine Over All.....	3 feet 11 inches.
Length of Engine Over All.....	7 feet 6 inches.
Approximate Weight with Iron Base..	5,600 pounds.
Installed	July 7th, 1907.
Value	\$750.00.
	Complete Set (10) Wrenches.
	One Monkey Wrench.
	One Adjustable Tram to preserve adjustment.
	One Set Grease Cups (6).
	One Hand Oil Pump.

GENERATORS.

Brushes	16
Manufacturer	Three Rivers Electric Co
Number	37,501.

Kilowatts	40.
Amperes	320.
Volts	125.
R. P. M.....	825.
Wound	Compound.
Installed	July 7th, 1907.
Value	\$450.00.

SERVICE (Started July 7th, 1907).

Year.	Hours in Service.	Hours Out of Service.
1907	3,190	5,570
1908	8,045	715
1909	7,745	1,015
1910	2,785	4,975
1911 .....	.....	.....
	<hr/> 22,765	<hr/> 12,275
January	200	544
February	229	443
March	367	377
April	407	313
May	364	380
June .....	.....	.....
July .....	.....	.....
August .....	.....	.....
September .....	.....	.....
October .....	.....	.....
November .....	.....	.....
December .....	.....	.....
	<hr/> 1,567	<hr/> 2,057

The coal that is used is weighed by the wheelbarrowful, and runs about 230 pounds to a wheelbarrow. I have not yet learned of any other city that uses coal in the same manner as in Duluth. If you do not know, you should know that Duluth is the distributing point of coal for a large part of the United States; the coal coming to Duluth in boats is loaded from the boats on the docks, and on these docks it is cleaned and screened, and we are using in our buildings what is known as anthracite dust, which screens about the same size as rice and finer, and Youghiogheny soft coal screenings, which come in the shape of dust, with particles about as large as a walnut, but most of it is fine like sand. We wet and mix these two coals together. A number of buildings burn two of the soft and one of the hard; some of them burn one part hard and one part soft. We are burning and have been burning, three of the hard and one soft, and we have burned as high as four to one. In burning the coal in this manner we make no smoke at all, and it cuts the cost of our coal down considerably, for the reason that we pay \$3.35 per ton for soft coal screenings and \$2.10 a ton for hard coal; therefore, when it is burned three or four to one, a noticeable saving is made.

In speaking of cost, I will say that where we have used two of soft and one of hard the cost has been \$2.93; where we have used half hard and half soft, \$2.72; where we have used two hard and one soft, \$2.51; where we have used three hard and one soft the cost has been \$2.41, and where we have used four hard and one soft the cost has been \$2.34.

The engineer always reports the reading of the general water meter, and as we know about what it should be from day to day, if it is larger all hands

are immediately put to work to find the leak. The water used in the boiler is also metered; that meter is read. The k. w. meter is read on the switch-board, showing the amount of current used. He then checks the other buildings heated, and checks those to whom we are furnishing the light, so that we can always check up our coal bill in case it is larger one day than another. He states on the bottom of his report whether any machinery has stopped on account of breakdown, and on the back of same he reports the supplies received and where they were used, or to be charged, and the name of the firm, the repairs needed, and the repairs made, signing same on the bottom.

As far as the engineer's report is concerned, we have found that when it became necessary to refer back to anything that happened in the past, that the introduction of figures stating what had been done, and what was being done did not seem to fit the case as it should, therefore we adopted the system of charting on paper what had been done, thus being able to place before the engineer or fireman a picture of what had been done in the past, and what was being done now, instead of making a comparison with a long string of figures. Another thing that has worked out very satisfactorily is bulletin boards, which hang directly alongside of my desk. These boards contain the office numbers of every office, and opposite each number is inserted a card, which, if occupied, contains the name of the tenant. On the back of this card is the amount of the rent that the tenant pays, and the expiration of his lease. If the office is vacant, the amount of rent per month is stated on the card.

I have in all now some 225 tenants, and it is impossible at times to remember all of their names. When a man comes into the office and I know he is a tenant, and I cannot recall his name, I ask him the number of his office, and by looking from my desk at the chart I can immediately call his name, and in this way I have found this office board register to be a very helpful device to be used in an office like mine, for the reason that it contains nearly all of the information that a manager would like to know.

We have a daily chart showing the consumption of coal for the k. w. hours of electric current made, the general house water meter, the boiler water meter, and the maximum and minimum temperatures, which I keep under glass on my table. We keep a regular coal balance, which is balanced and checked from the tickets and bills at the end of every month. This balance shows the amount reported consumed, the amount on hand, and the amount received, as follows:

BUILDING NO. 3.

Coal Report. April, 1911.

	Dust.		Screenings.	
	Dr.	Cr.	Dr.	Cr.
Coal on hand, April 1st.....	3,000	.....	4,000	.....
Received N. W. Fuel Co.....	85,900	.....	24,300	.....
Received N. L. Fuel Co.....	76,300	.....	41,600	.....
Reported burned		166,100	.....	56,700
On hand May 1st		8,000	.....	2,000
	165,200	174,100	69,900	58,700
Not accounted for.....	8,900	.....	.....	11,200
	174,100	174,100	69,900	69,900

N. W. Fuel Co.—			
Dust	85,900 lb.	42.95 T.@	\$2.25..\$96.64
Screenings	24,300 lb.	12.15 T.@	3.35.. 40.68
	110,200	55.10 T.	\$137.32
N. L. Fuel Co.—			
Dust	76,300 lb.	38.15 T.@	\$2.25..\$85.86
Screenings	41,600 lb.	20.8 T.@	3.35.. 69.69
	117,900	58.95 T.	\$155.55
Total Coal Consumed—			
Dust	157,200 lb.	78.6 T.@	\$2.25..\$176.85...70%
Screenings	67,900 lb.	33.95 T.@	3.35. 113.73...30%
	225,100	112.55 T.	\$290.58

Blank "H."

Since the year 1907 I have kept charts of the coal from the balances as shown, and the temperature, by the month. When I first took buildings Nos. 1 and 2 they were buying coal that was supposed to be mixed, two of soft and one of hard. Later on they were supposed to be delivering it half and half, and charging us on the basis it was supposed to be mixed at, that is, at the rate of \$2.10 per ton for the hard and \$3.35 per ton for the soft. I had the coal companies start in January, 1907, in all three buildings, to deliver the coal separately and we to do the mixing ourselves. We weighed the coal out by the wheelbarrowful, and endeavored to get the firemen to mix it three to one, that is, three hard and one soft. They had a hard time in getting started and it was not until the month of June that they all got running in the path they should run in relative to the percentage, and they continued this percentage until January, 1910, when, without a word of warning whatever from the coal companies, our hard coal was shut off. In Duluth it is practically impossible to make a contract for coal. The prices are all the same, and the coal companies do not even approach you relative to making a contract. In fact, they do not want to make a contract, but are all willing to sell you coal at the one price, no less.

Now, the next question, when you get to burning three of hard and one of soft, is whether or not your consumption is increased, therefore to watch this we make a chart monthly showing the consumption of both kinds of coal. If you burn a larger quantity in making a mixture you are not saving any money, as you are making a mixture of three to one to save money. The quantity must not be increased. There may be a chance that the weather is cooler, and that it is necessary to burn a larger quantity. We, therefore, refer to our mean minimum temperature chart, which shows the weather for every month, etc.

Relative to these charts, a few of the people who have visited my office have made the remark, "Are not these reports and the chart business a lot of trouble and extra expense? In other words, is it not a hobby more than a necessity? We do not see that you get any real benefit from it."

The real benefit derived is this: First of all, if you are careful and methodical in the way that you perform your work, your clients know that you are endeavoring to manage your buildings at the least possible expense. Then, again, it is much easier to show an engineer and fireman or a janitor what they are doing with a chart, showing the ups and downs by lines, than it is showing them a long string of figures. Figures puzzle them, whereas a chart is a very simple thing, where you state to them when the line is up

that this represents your coal pile is so much larger than yesterday, the day before, or so on; you did not make any more light; you, of course, used more water, and the temperature was not any colder than it was the other days. Now, there are your reports drawn out in lines. What is the trouble? Can it not be fixed?

It is much easier to show them than with figures. Figures to some men do not mean much, and at the same time they are in evidence on these charts.

Then, again, your owner comes in and with these charts always before you it is much easier to show him than it is to get out a large number of reports and go over them to show him the whys and the wherefores. In fact, although they look like a lot of work, the work in connection therewith does not amount to half of the trouble that it saves, and in time I hope to have everything charted and hung on the wall in my office.

One of the most interesting charts to most people is the chart showing the rental value of the building for each year; that is to say, what the building is bringing in per square foot if every office is occupied. You can show the vacancies, the delinquent rents and the lost rents, and on the same chart also show the gross amount received from the building for each year. This chart shows how simple it is to explain to the owner what you are doing by saying, "Here is what the building earned in 1908, here is what the building earned in 1909, and here is what the building earned in 1910." Its earning capacity has been increasing each year, and while it has been increasing, your delinquent rents, your lost rents and your vacancies have not been any greater.

It is easy to increase the rents. The next thing is to keep your tenants. These buildings when I first took them were renting for less than fifty cents per square foot, so you can now see for what they are renting. I have started with the year 1908 for the reason that in 1908 a new building, 50 feet front by 115 feet deep and seven stories high, of steel construction, modern in every detail, was built, and that year I lost out of my buildings, all three of them, only two tenants. In 1910, a sixteen-story building, 50 feet front and 115 feet deep, modern in every detail, was built. I lost that year four or five tenants out of all my buildings. In 1911 a six-story building, modern in every detail, and the same ground floor space as the others, was opened up and I am glad to say I only lost two tenants.

I believe that I owe my good luck in keeping tenants by adopting a method or system by which I am able to keep track of what is being done, and when they visit my office and see these charts, which are under glass on the walls and on my table, they know that every effort is being made relative to the operation of the buildings, and that I am in touch with what is being done. I have always found it wise and more economical in the end to give the tenants repairs that they are of the opinion they need, that are within reason, and in return I have had tenants go out of their way to bring into my office a man who is seeking a location, recommending to this man that he go into one of the buildings in my charge.



Accounting System for Office Buildings

By Edwin Wasserman

THE subject of accounting for office buildings is probably one of the most vexing questions which office building managers have to confront. The manager must know each month the results of all operations of the building, and the information must be such that the expenses are kept under proper control by intimate knowledge, so that any extravagant or unnecessary expenditures may be prevented.

The office building which I represent is known as the Pacific Building, Market and Fourth Streets, San Francisco. During the time of the erection of this building (which occupied less than one year) a great many duties devolved upon me in the way of supervision of the details of construction for the Pacific company.

During the time of construction I was aware, of course, that I should be put in charge of the building after its completion, and it seemed to me that a good system of accounting was a first necessity. I therefore evolved and installed the system to which I am calling your attention (with a few minor changes which have been deemed advisable in the light of actual experience).

The question of keeping the keys of a large office building (I may say here that the Pacific building has 560 offices) in proper manner is the first thing that confronts one. The system that I have adopted is as follows:

When the locks were received from the manufacturer there were three keys for each lock. As soon as the locks were placed in the building, I had every key stamped with the number of the room. For obvious reasons, I did not wish to use arabic figures which indicate the room number, I therefore adopted a cypher, replacing the numeral digits by alphabetical letters. Instead of using the ten first letters of the alphabet, however, I adopted the practice in vogue in a great many stores, of using some simple cypher word—such as “Black Shirt”—in this case it will be seen that key number 135 would bear the cypher B. A. K. and so on. If, therefore, a key is lost in the building and subsequently restored to the office, the number of the room can be easily identified and the key restored.

In some cases a larger number of keys are desired by the tenant or a key might be lost. To provide for this contingency, instead of having the keys made outside, I bought a key machine from a Chicago hardware concern, costing me about \$20, and with the aid of this machine a new key can be turned out in the engine room within a few minutes. As the total cost of this duplicate key would be about six cents, and we charge from twenty to twenty-five cents, it can be readily seen the key-making turns us in a little profit.

Of the three keys which come with the lock, one is placed in the office of the building on a properly numbered rack, and two placed in a small envelope. When the keys are taken from the envelopes and turned over

to the tenant a receipt is obtained on the envelope and remains as a charge against the tenant until keys are returned by the tenant. These envelopes can all be placed in a small 4 x 5 cabinet of four drawers capacity, or less, according to size of building. The object of keeping one key in the office at all times, on the rack, is for the purpose of duplication only.

For the purpose of keeping accurate record of the income of the building, we use a card with as many columns as there are floors, and as many lines as there are offices on each floor. The card accommodates sixty-six offices on each floor. This card when properly filled at the beginning of the month, indicates the total income for the month of each room, each floor and a summary showing the income from the entire building. The total is charged to an account in the ledger called "Tenant Account." An auxiliary tenants' card ledger is also used, which contains the following information: Name of tenants, date of lease, room number, and monthly rate. This card is ruled up in months and as there are eight sections on the card each section accommodating entries for twelve months, the one card will take care of a tenant for eight years. On the first of each month these cards are posted up with the amount of rentals and later, when the bills are paid, the paid date is inserted as well as the sum paid. The balance of any one card shows the amount due from that particular tenant. The balance of all the cards equals the balance appearing in the ledger in the Tenant Account. In the Tenant Account of the ledger there will be but two principal entries a month; one total of debits and the other total amount of cash received. The tenant ledger card is placed in a "cemetery" as soon as the lease has expired, the tenant has left the building and delinquent rents have been paid. This is done for the purpose of keeping the ledger filled with only live matter and makes the card ledger less cumbersome.

As soon as bills and pay rolls have been properly approved and passed upon, a voucher is made out and the bills or pay roll are paid by the issuance of a check. On the margin of the checks is a little statement form showing the date of the bill paid by the check and the explanation of the indebtedness. It is not necessary to get a receipt from the payee or the employe as the fact that the checks must be endorsed before payment secures good evidence of the receipt of the payment for the purposes named on the face of the check. These checks are numbered in numerical sequence and I have found it to be most advantageous to use the "Economik" system of check books, the simplest plan of check register that I have met. The sheets of the check register are numbered to agree with the checks themselves. The checks have no stubs and it requires little mental effort to get into the habit of always writing the particulars in the check register before making out the check.

The Cash Journal.

The cash journal is the main book of entry for everything appertaining to the building. The explanation column is placed in the middle of the page, and of the other columns the middle one on each side is marked "cash." The balance of these two columns shows the balance of the bank account, the credit side being balanced with the check register; the voucher number is in each case the number of the check covering payment. On the debit side of the cash journal is a column marked expense. In this

column are placed all items except those which require individual ledger posting. On the credit side there is a column marked "tenant account," and the total of this column monthly is posted to the tenant account in the ledger and forms the main credit of that account. Journal entries are made as may be necessary, but inasmuch as the cash is always kept separate and in its own columns the system obviates the objections offered by accountants to having a combination cash book and journal.

As the close of the month the column marked "Expense" is segregated into the necessary subheadings such as "elevator cost," "pay roll," "repairs," "supplies," and such other items as may be deemed necessary for purposes of keeping accurate information as to sources of expenses and comparative expenses from month to month according to the maintenance sheet.

The information obtained from this column is embodied in the monthly report of the building which is submitted to the directors of the company. The report shows revenue from rentals and from other sources on the one side, and expenditures covered by miscellaneous expenses for the upkeep of the building on the other side. The difference of these two columns will, of course, show the profit or loss for the month. The expenditure column does not show actual cash expenditures in certain items of overhead expense, such as insurance or taxes. For the purpose of accurate statement of profit or loss, taxes, which are paid in two installments, are placed to a suspense account and each month one-twelfth of the total amount of the taxes is included in this overhead expense. The same method of prorating is followed in the posting of insurance items. On the report there is also a financial statement which shows the actual cash movement for the month and an additional statement is included showing overdue rentals, compiled from the tenant's ledger.

The maintenance record supports the report just mentioned, and sets forth in items the various expenses for elevators, pay roll and so forth, properly segregated.

The maintenance record and the monthly report should be on thin paper so that carbon copies may be made to accommodate each of the directors with a copy.

The insurance carried in an office building includes protection against fire, casualty, elevator, boiler and plate glass losses.

In the matter of insurance it will be well so far as possible to arrange the policy period so that of the total insurance carried, one-twelfth will fall due each month. Such a system simplifies the work of the office building manager and the insurance company will cancel and rewrite the policy without short rating if the object of the scheme is made known to them. The system which I have outlined has worked out for me a great many problems in a most satisfactory manner. Local conditions, size of building, and so forth, will naturally suggest a modification of this system, but if the fundamentals to which I have called your attention are followed, I believe most thoroughly that office building managers will be able to get a maximum of information and security with a minimum of work, and from what I have gathered in talking with other managers, I believe that a simple system, such as outlined, eliminates a great deal of anxiety and worry.

The main points of the system are the tenant's card, the building rental card and the combination cash journal. Entries in detail are made but once

and then in the cash journal. On the card the entries are of the simplest form and take very little time. The monthly and maintenance reports give in totals and detail just the information that the directors require and provide essential data only. The ledger is kept free from unnecessary postings, as in the majority of accounts there is but one entry and the ledger accounts are reduced to a minimum.



Various Systems for Keeping Office Keys

THE following data in regard to keeping keys has been collected from various sources for the benefit of those interested in knowing how others are doing:

One of the leading Chicago managers has the following to say:

"I find that the simplest, easiest, and most convenient way is to get a large brass ring, about eight inches in diameter, with a hole in the center small enough that the janitor cannot hang it on the knob of the door, and have a number of small holes bored around the edge, then attach each key to the ring by a short steel chain. Those key rings are kept on a rack in my superintendent's office. No one has access to them except the superintendent. He gives them to the different janitors when they start out on their work at night and they put them on their belts.

"We have a key to each room. No one has a right in that room except the superintendent and janitor. In case of fire or leakage of steam, or breakage, we have a right to go in. A master key might get into the hands of somebody else. If a key or a ring of keys should be lost, I can take every cylinder out and change the locks around so that nobody would ever be able to make use of the keys.

"In regard to the new keys, when the locks were put in I had the contractors put the keys in the box in which they came and put the room number on each box; three keys came with each lock. Those were turned in to my superintendent and he filed them by numbers, in a box in a drawer file. He puts one key on his large ring; the other two keys are kept on file in the boxes until the room is rented. It does not take up as much room as you may suppose; it takes up very little.

"In the matter of extra keys, when order is received for a key, it is filed; the key is made. After the first two keys are furnished the tenant pays 25 cents for each subsequent key. The ladies' toilet is open all day, and at six o'clock at night it is closed and locked. No one after that goes in except the janitors who clean the premises."

Another manager in a western city contributes the following to the discussion:

"We have a little system for keys that may be interesting. We had a key tag made, which is, in appearance, like a hardwood tag instead of being a piece of paper; this was doubled over with an opening at the end. When the key is not in use it is turned back and slipped into the envelope and, on the outside of that envelope, the marking of the building, the room number, etc., are kept in a card index, as your card index is your key file, and your key file is your key tag."

Here is another system installed by an Ohio manager:

"The proposition I have with keys is a big counter in my room and up alongside of that counter is a cabinet built full of pigeon holes, with a sliding glass door, and up on the cross pieces above each box is the number of the room starting from 101 and running to 1001. We have about 100 rooms in our building. In each of the pigeon holes are three keys, and a

little slip of paper, and on top of that paper is the number of the room. John Smith comes in and gets three keys; he puts his name on the slip and it is put up into the pigeon hole. The minute I go to the pigeon hole and find there are only two names on the card and no third key, I know someone is at the office. When the janitor wants to go into a room that is not occupied, we make a temporary note showing where that key is, and when it is placed back into there, of course that slip is destroyed.

"I keep another record of the keys in a book, separate from this case, showing the number of the room and then the key number. There is generally a little number placed on there; it would probably run pretty large, the factory number of the keys, but I keep the room number and the factory number, and the factory number might be 9620, and if I should find a stray key with that number, instead of trying all the doors in the building, I simply refer to that book and find where that key belongs.

"In reference to the superintendent of the building, I carry a general master key to all rooms, but the general superintendent only carries a master key to the separate floors. For instance, my key will fit the store room on the first floor, and he has no key to that.

"I believe the key arrangement I have there is very satisfactory. You can put your hand on any key in a minute. If you find a stray key, you can tell where it belongs."



PART IV

Operation

The Cost of Operating a Building

By C. A. Patterson

THE tenant who comes down to his office in the morning has an idea that the office building owner is getting wealth at a tremendous rate by renting offices at say \$1.50 per square foot.

As the books of an office building are seldom opened to the public gaze, and the expense of keeping up a building is hidden from the tenants' view, because the engine room coal pile, etc., are out of sight, and the cleaning is all done by night.

The thousands of people who have offices in the modern skyscraper or have occasion to visit one on business, seldom have a glimpse behind the scenes to see the smooth and orderly running machinery. They only know that the elevators are always ready to whisk them up to the particular floor to which they wish to go; that the floors and windows are always clean, that the lights are always in good condition, and that in the winter the offices are always comfortably warm. The tenants leave the offices at night littered with papers and in confusion; they come down in the morning to find all the litter cleared away and everything in spick and span order. If it is not, they growl, and then someone has to get busy.

It takes a big sum of money to keep everything clean and tidy, the elevator service up to standard, and all the other details to make the tenant comfortable. It is the multiplicity of small expenses that counts in the office building. You can tell positively what the great expenses are going to be before you have the building erected, and therefore can figure accordingly. There are other expenses, however, that cannot be absolutely determined. For instance, we know that we are going to require a certain amount of labor, but there is no certainty what that labor is going to cost. We also know what amount of coal we are going to require, but who can predict a year in advance the price of coal?

Suppose, for example, we take an office building representing an investment of \$1,500,000, including the land. This is by no means over the average cost of those now being erected. There are some costing six and eight millions. A capitalist should certainly expect ten percent on his investment; in fact, he could not afford to tie up this amount of money for less. However, let us presume he is satisfied with ten percent, which would make a return on his investment of \$150,000 per year, provided he rents all his space, keeps it rented, and has it all paid for.

Although a well managed building does not often lose tenants, yet it sometimes happens when large tenants erect their own structure or change their location to be nearer a base of supplies, etc. With these things the manager must contend, which makes it impossible to count very far ahead on the entire revenue.

Here is where big lumps of that \$150,000 revenue goes. Taxes and insurance eat up easily \$35,000, and, although this is probably the largest single item of expense, yet there are many others which call for big outlays. For instance, there is the item of coal. The elevators must run win-

ter and summer, but in the summer the consumption of fuel is not as great as in winter, because heat does not have to be furnished the offices. Averaging the cost of coal for a year, the daily consumption would be twenty tons each day or 7,300 tons per year. For the sake of comparison, let us take the average cost per ton of coal, which is \$2.15. This for the year makes our coal bill alone \$15,695. Sometimes the price per ton will be a little lower and sometimes a little higher. A building consuming any such amount will contract for its coal by the year, and thus is able to avoid fluctuations in price. Users of coal are getting a little wiser than they used to be. In the best operating buildings coal is checked up and purchased on a B. T. U. basis or some similar method is used to really ascertain the number of heat units produced per pound or its evaporating power. A hundred pounds of coal, for instance, must evaporate a minimum amount of water. If it evaporates more than the minimum it is worth more per ton. Once a week a chemist takes the sample of coal and tests it, and on the result of this test the price is made. By this method the manager pays for fuel, not for slate and slack.

However, next to taxes, the largest item of expense is that of labor. This will easily reach a figure of \$30,000 per year, including the office force. To keep the building tidy you will have to employ a small army of scrub women, who do their work at night. Figures from such a building as we described show that they have twenty women employed, six nights a week, and each gets \$28 a month, which figures out \$7,392 a year. Every office is swept and dusted every night, many of them are scrubbed, cuspidors have to be washed out, waste paper baskets emptied, and then all the halls and stairs have to be swept and scrubbed. This is a work that cannot be delayed or slighted. The only way in which absolute cleanliness can be maintained is by never ceasing vigilance. To help the women in their work there are six male helpers at \$40 a month each, or \$3,280 a year. These men sack the waste paper and carry it down to the basement, where it is baled, and do various other kinds of work that call for strength and are out of a woman's province.

The night force must be looked after by a responsible head, so a superintendent is necessary and in many buildings an additional chief janitor. The superintendent must be a good, reliable man, for he has the entire responsibility of the building at night. Such a man is worth \$1,500 a year and earns every cent of it. The superintendent has charge of the supplies, inspects the work, hires the janitors, scrub women, etc., and sees that the service is kept up to standard.

A big office building has to have a painter for its own work alone, and it is often necessary to call in outside help. Every time an office is vacated it has to be gone over by the painter, the ceilings and walls done over, and woodwork and floors touched up. In the case of long time tenants their offices have to be overhauled at regular intervals, so you can readily perceive that the painter has enough to keep him busy. In addition to the offices, the halls have to be kept immaculate. The painter's store room represents a good-size store well stocked, for he must have a considerable variety of paints, white lead, varnish, enamel for painting the iron work, resin, and no end of brushes, tools, etc. The supplies for the decorator alone will average \$3,000 a year. Some years it is much more. Others not quite so much, depending, of course, upon the class of building.

Cleaning the windows might seem a small expense, but here it about

the way it figures out. It takes the entire time of six men to do this work. They begin on the top floor and work down to the bottom until they have washed every window, and then they begin all over again. Window washers get \$40 per month, and they are under the chief janitor, who hires them and provides them with safety appliances and all the working tools they require. In addition to washing windows they go through all the offices and wash and clean all the gas and electric light fixtures. This item represents a yearly outlay of \$2,880 for wages alone.

In such a building as we are describing there are six elevators. It is necessary to have a man for each car, as well as a starter. These men receive a wage of \$55 and \$60 per month, the starter getting \$70. The elevator man occupies a responsible position in the office building. He must be steady and reliable, because to his carefulness the lives of hundreds of people are entrusted every day. He must be intelligent, courteous in manner and neat in appearance. He will be asked hundreds of questions a day about the location of tenants in the building and have to be an animated guidepost. Such men are worth a little more every year they stay with you, and should be paid on that basis. By the time the manager has paid the elevator force each year there isn't much left of \$5,000. Uniforms and clean linen must be provided for these men, which means more expense.

The engine room is a never-tiring "dollar eater." The labor expense alone is \$3,200, of which the chief engineer gets a salary of \$1,800, and his assistant and fireman cost \$1,400 per year.

Most large buildings have found it economy to keep a carpenter, as there is a great deal of changing partitions, repairing, etc., constantly needed. This is another item of \$3,000, including supplies and labor.

Sometimes the painter does the carpentry work, but usually there is work enough for both.

Then there is the electrician, who has his hands full keeping the electrical equipment in first-class shape. Labor and supplies will eat up another \$3,000 annually.

We have not touched upon the supply question to any extent, but this represents a big outlay every year, much larger than the average person would realize.

For the cleaning alone 26,000 pounds of cleaning powder were used in one building last year and 10,000 bars of soap. Scrub brushes and pails are bought by the gross and dusting cloth by the bolt; dusters, floor brooms, mops, mop wringers, sponges, squeegees, and a full line of janitors' supplies are constantly consumed.

Managers have found it economical to keep a full line of pumping supplies on hand. Wash bowls, urinals, closets, seats, tanks, valves, cocks, etc., are bought in dozen lots and stored in the stock rooms for instant use. Many buildings keep their own plumber and find it a good proposition from a financial standpoint. It is difficult to estimate the expense of this department, as it varies so widely from year to year, but in a building erected several years ago \$3,500 is not considered high.

We have not touched upon the engine room supplies, except coal, but besides this, there is oil, usually contracted for several barrels at a time; there is waste and packing constantly consumed.

Other expenses which have been discussed but not itemized will bring this total up to \$100,000 per year. No allowance has been made for depreciation of machinery or deterioration of the building. It is estimated that

the life of an office building power plant is from 10 to 15 years. A low figure of original cost of the plant equipment would be \$200,000. The writer knows of one building manager that bought last year \$85,000 worth of new machinery. Ten percent of the equipment cost is considered fair to charge off for displacements and repairs, or, in other words, an allowance of \$20,000 is made annually to keep the plant in first-class shape.

So it will be seen from these figures that it isn't all velvet from the owner's standpoint and there is really no form of investment that requires the careful watching to make the figures appear on the right side of the ledger as does the management of a modern office building. Can one wonder why it is that the building managers want to get together every year, compare figures and study their work more closely?



Ratio of Gross and Net Cost of Operating to Gross Rents of Office, Loft and Apartment Buildings

By Clarence T. Coley, M. E.

WHEN I took up my present work several years ago, with Douglas Robinson, Charles S. Brown & Co., and was told my business was to operate the buildings in their charge with the highest degree of efficiency, I saw that the best tool with which to accomplish the desired results would be the "deadly parallel" or comparison of figures, derived from carefully kept subdivided accounts. Our system of bookkeeping was changed so that our accounts are subdivided under twenty different headings.

By carefully watching the operation of each building and the classification of charges, I am able to give the following percentage of cost to gross rents, and costs per square foot, or room, of rentable area, besides interesting figures on cost of heating per season, elevator power, and repairs.

So far as I know, the information which my figures give, is the first of its kind which has ever been compiled, or at least given out as public information.

I wish to warn against the use of my figures in estimating upon the probable cost of operating any building which may come before you. They cannot be used accurately, unless the person doing so knows exactly the conditions under which they were made, and the property under consideration corresponds in detail with the original. I have had the satisfaction of estimating upon the cost of operating proposed buildings from the plans by the use of similar figures—backed up by my experience—and seeing the actual cost of operating the finished building follow my estimate very closely.

I also use such figures extensively in estimating upon the proper cost of operating old buildings which have been extravagantly run, and the results obtained after my recommendations were put into effect proved very gratifying to the owners, as well as to myself. My success in the use of figures derived from actual economic operation of buildings developed a new branch for us in the appraisal of costs of building operation.

I have done a considerable amount of that work in New York. People come to us to find out what the probable cost of operating a new building will be before they put their money into the venture. Also a great number of owners of old buildings which are not doing as well as they should, come to us to see what the remedy is. We are the Doctor. We recommend the remedy.

All the following figures given are averages of the actual costs of operation during the last three fiscal years, under our management. All of the buildings are over eight years old, so that all newness has won off and the

repairs are at their normal working point. No selection was made with regard to favorable results, but with regard as being typical of a class or type of building. I do not consider these figures showing extraordinary records, but as figures obtained from the results of actual unpretentious operation.

We will consider the subject under the three classifications: Office Buildings, Loft Buildings, and Tenement or Apartment Houses. Tenement is a general expression applied in New York to any apartment house. Any house containing more than two families is generally known as a tenement.

Under the first class I have considered three distinct types:

- Large, high class financial office buildings.
- Large commercial office buildings.
- Small modern (insurance and general) office buildings.

The second class includes:

- High grade semi-fireproof loft buildings.
- Medium sized non-fireproof loft buildings.

The third class (tenement houses) includes:

- Old style non-fireproof, high class apartment houses.
- Modern semi-fireproof, medium grade apartments.
- Good grade non-fireproof flats.

Large, High Class, Financial.

- Highest type office building in New York.
- Heavy duty for elevators.
- Over twenty stories high.
- Very liberal supply of electric light.
- Hot, cold and refrigerated water.
- Large quantity of marble and brass to polish.
- Complete mechanical plant.
- Kept up to high state of repair and reliability of operation.
- Tenants: Bankers, stock brokers and lawyers.
- Cement floors in offices.

Large Financial Office Building.

This building is properly located. We have not had a vacancy in the building for the last four years. The location of this building is its chief asset, so the loss of rents and loss by vacancies is nil. Rentable area, 111,022 square feet. Cubical contents, 2,600,000 cubic feet.

Gross rents	\$316,841.65
Vacancies and loss of rents.....	0.0
Engine room labor, repairs and supplies to gross rents.....	6 %
Coal and removing ashes to gross rents.....	5.37%
Elevator labor, repairs and supplies to gross rents.....	3.1%
Janitor labor and supplies to gross rents.....	5.2%
Electrician's labor and supplies to gross rents.....	.625%
Supervision (supt. and agents' comm.) to gross rents.....	3.2%
Building repairs and improvements to gross rents.....	5.3%
Insurance—fire, boiler, accident, plate—to gross rents.....	.46%
Water tax to gross rents.....	.78%
City general taxes to gross rents.....	18.1%
Sundries to gross rents .....	.25%
Gross cost of operating to gross rents	48.385%
Net cost of operation (gross taxes) to gross rents.....	30.285%

Engine room repairs and supplies to coal bill.....	57%
Cost of repairs and supplies per elev. per annum.....	\$589.86
Janitor's supplies to janitor labor.....	8.8%
Electricians' labor to electrical supplies.....	33.6%
Average gross rent per sq. ft. of rental area.....	\$2.85
Cost of engine room labor, supplies and repairs per sq. ft. of rentable area .....	.173
Cost of coal per square foot of rental area.....	.153
Cost of elevator labor, supplies and repairs per sq. ft. of rent- able area .....	.08¾
Cost of janitor's labor and supplies per sq. ft. of rentable area..	.149
Cost of electric labor and supplies per sq. ft. of rentable area..	.017
Cost of supervision per sq. ft. of rentable area.....	.093
Cost of building repairs and improvements per sq. ft. of rent- able area .....	.15
Cost of insurance per sq. ft. of rentable area.....	.013
Cost of water per sq. ft. of rentable area.....	.023
Cost of taxes per sq. ft. of rentable area.....	.516
Cost of sundries per sq. ft. of rentable area.....	.008
Total cost of operation per sq. ft. of rentable area.....	1.382
Return to owner per sq. ft. of rentable area.....	1.468
Percent net return to book value of investment.....	3.62

"Cost of repairs and supplies per elevator per annum—\$389.86." It costs between \$500 and \$600 to repair one elevator a year. That is a modern vertical type, hydraulic piston elevator.

"Janitor's supplies to janitor labor—8.8%." The ratio between the cost of supplies and the cost of labor is 8.8%, that is high. I want you to remember that point, 8.8%. I will show you other buildings which are much cheaper because they are not of that high, exacting nature.

Large Commercial Office Buildings.

Obsolete type of office buildings.

Large, slow speed elevators.

Under fifteen, over ten stories high.

Large tiled halls. Considerable waste space in halls and courts.

Wooden trim. Small amount of brass to polish.

Moderate demands for light.

Complete mechanical plant. Well kept up.

Building kept up to good state of repairs.

That is the only thing that saves that building—the fact that we give first-class service as far as we are able with the tools that we have to work with, and that the building is now in a good state of repairs.

Tenants: General commercial business.

A large space occupied by owners.

Wooden floors in offices.

Large Commercial Office Building.

Eleven elevators.

192,687 square feet rentable area.

Contents, 7,076,300 cubic feet.

Large space occupied by owners, 35,000 ft. space.

\$150,000 rent. Wooden floors in all offices.

Gross rents	\$413,840.00
Vacancies and loss of rents.....	3%
Engine room labor, repairs and supplies to gross rents.....	2.43%
Coal and removing ashes	3.48%
Elevator labor, supplies and repairs to gross rents.....	2.82%

Janitor's labor and supplies.....	6.07%
Electrician's labor and supplies to gross rents.....	.77%
Supervision (superintendent's and agents' commissions).....	2.25%
Building repairs and improvements, Imp::R::l::3.....	3.87%
Insurance .....	.84%
Water tax to gross rents.....	.55%
Sundries .....	.48%
Taxes to gross rents	15.02%
Gross cost of operation to gross rents.....	41.08%
Net cost of operation (gross taxes and vacancies).....	23.06
Engine room repairs and supplies to coal bill.....	31.8
Cost of repairs and supplies per elevator per annum.....	432.00
Janitor supplies to janitor labor.....	6.1
Electrician's labor to electrical supplies.....	11.2
Average gross rent per sq. ft. of rentable area.....	1.82
Cost of engine room labor and supplies and repairs per sq. ft. of rentable area .....	.044
Cost of coal per sq. ft. of rentable area.....	.063
Cost of elevator labor, repairs and supplies per sq. ft. of rent- able area .....	.051
Cost of janitor's labor and supplies per sq. ft. of rentable area.....	.110
Cost of electrician's labor and supplies per sq. ft. of rentable area .....	.014
Cost of supervision per sq. ft. of rentable area.....	.036
Cost of building repairs and improvements per sq. ft. of rent- able area .....	.071
Cost of vacancies per sq. ft. of rentable area.....	.035
Cost of insurance per sq. ft. of rentable area.....	.015
Cost of water per sq. ft. of rentable area.....	.010
Cost of taxes per sq. ft. of rentable area.....	.273
Cost of sundries per sq. ft. of rentable area.....	.009
Total cost of operation per sq. ft. of rentable area.....	.731
Return to owner per sq. ft. of rentable area.....	1.089
Appraised rent of space occupied by owner.....	2.2%
Percent net return to book value.....	5.38%

"Vacancies and loss of rents—3%." In that building vacancies have averaged 3% for the last three years.

"Cost of repairs and supplies per elevator per annum—\$432." The elevators are the old horizontal piston type of elevators. That is quite a reasonable cost.

Small Modern Office Buildings.

No local power plant, except in No. 2 there is a heating equipment.

All electric elevator and light power purchased from the street supply.

Over twelve stories, under fifteen.

Electric elevators.

No. 1 has more people per unit than No. 2, consequently higher elevator and water costs. There is something that is going to affect our cost, the fact that we have an average of five men in an office in this building and four men in an office in the other building. It is going to affect the cost, as you will see later.

Medium supply of electric light.

No. 1 hot and cold water all the year.

No. 2 hot water in winter only. Cold water all the year.

Buildings kept up to good state of repair.

Wooden floors. Fireproof construction.

Tenants: Insurance brokers, lawyers and general business.

No superintendent's living quarters provided.

No. 2 gives hot water only in the winter time, when the boiler is running.

Small Modern Office Building.

(Insurance and General.)

	No. 1	No. 2.
Rentable area in square feet.....	25,700	34,500
Cubical contents in cubic feet.....	557,300	826,700
Gross rents	\$47,300	\$67,200
Vacancies and loss of rents to gross rents.....	4.2%	7.4%
Cost of heat (repairs, supplies, etc.).....	3.8%	1.7%
Cost of elevator service (power, repairs and labor) to gross rents	9.1%	7.2%
Cost of janitor's labor and supplies to gross rents.....	7.3%	6.4%
Cost of electricity and supplies for light to gross rents.....	6.4%	6.3%
Cost of supervision to gross rents.....	5.3%	4.2%
Cost of building repairs and improvements to gross rents....	2.4%	4.3%
Cost of insurance to gross rents.....	.7%	1.6%
Cost of water to gross rents.....	.6%	.3%
Cost of taxes to gross rents.....	11.8%	17.2%
Cost of sundries to gross rents.....	.1%	.2%
Cost of operation to gross rents.....	51.7%	56.8%
Net cost of operation to gross rents (taxes and vacancies)..	35.7%	32.2%
Average gross rent per sq. ft. rentable area.....	\$1.84	\$1.95
Cost of heat per sq. ft. rentable area.....	.075	.032
Cost of elevator service per sq. ft. rentable area.....	.168	.42
Cost of janitor service per sq. ft. rentable area.....	.133	.116
Cost of light per sq. ft. rentable area.....	.117	.116
Cost of supervision per sq. ft. rentable area.....	.098	.077
Cost of building repairs and improvements per sq. ft. rentable area .....	.044	.73
Cost of insurance per sq. ft. rentable area.....	.012	.028
Cost of water per sq. ft. rentable area.....	.012	.006
Cost of city taxes per sq. ft. rentable area.....	.217	.31
Cost of sundries per sq. ft. rentable area.....	.003	.003
Cost of vacancies per sq. ft. rentable area.....	.042	.145

Total cost of operation per sq. ft. rentable area.....	\$0.921	\$1.045.
Return to owner per sq. ft. rentable area.....	.919	.905
Per cent net return to book value of property.....	4.5%	4.8%
Cost of heat per 1,000 cubic ft. per season.....	\$ 3.29	\$ 1.32
Cost of repairs and supplies per elevator car per annum....	61.00	157.00
Cost of electric power per car per annum.....	955.00	743.00
Electrical supplies to electric light power.....	5%	9.8%
Janitor's supplies to cost of janitor's labor.....	6%	5.5%

"Cost of heat—3.8, 1.7%." Here is an interesting thing. The cost of heat in No. 1, which buys all its heat from the public service supply, is 3.8 of the gross rent. In the other building it is 1.7. They therefore heat their building with local apparatus for 50% of the cost of public service in New York. We must not forget, however, that the purchased steam is a great convenience. It saves rentable space in the basement. It saves also very valuable space on the first floor.

"Cost of elevator service (power, repair and labor)—9.1%, 7.2%." That includes everything, labor for operating the car, repairs, supplies, such as oil, waste, etc., and the cost of electricity to operate the elevators. There is the first place where the crowded condition of the building commences to show. The No. 1 building has got to make more trips per hour per car than in No. 2.

"Per cent net return to book value of property—4.5%, 4.8%." I have been asked, "What are you getting for your money in New York on real estate?" This gives you a fair idea. Of course the book value may be rather high, higher than the salable value of the building.

"Cost of heat per 1,000 cu. ft. per season, \$3.29, \$1.32." For the local

heating plant it is \$1.32 per 1,000 cu. ft. for heating season. I want you just to note that figure—\$1.32. Then when I come to loft buildings and apartment houses I want you to also remember and note how it changes.

"Cost of repairs and supplies per elevator car per annum, \$61, \$157." There are two figures that do not correspond at all. You ask why that is. The fact is that the No. 2 building, the \$157 building, was unfortunate in those three years. All the roping of the three cars came in those three years. They had to be re-roped during that period. There were two armatures in the basement burned out, caused by an extra high tide coming over the water-proofing in the basement, so that the cost of repairs on that elevator is a little high compared with the repairs on No. 1.

"Cost for electric power per car per annum, \$955, \$743." Nine hundred and fifty-five dollars at 5 cents per kilowatt for electricity. In the other case it was \$743. One elevator had to take more trips than the other to handle the traffic.

I might explain the term "gross rents" as used in these tables. Gross rents are the rents actually collected by us plus the value of the vacancies, what the building would bring in if it was full. That is what is meant by gross rents.

I might mention that in these two buildings the cost of lighting the building was about 6½% of the total gross rents of the building. We give free lights in New York. It should not be. Tenants waste it. They abuse the privilege. It costs us about six to seven percent of the gross rents of the building to give them free light.

In New York City the cost of taxes is about 17, 18 or 20%. Our values are very high, therefore the tax percentage is high. Eighteen percent of the gross rents of the buildings are paid out every year by the owners to the city for taxes.

High Grade Semi-Fireproof Loft Building.

Good grade of building.

Separate freight and passenger elevator service at different entrances.

No. 1 both elevators electric. No. 2 passenger elevators electric. Freight elevators, steam engine.

Ten stories high.

Wooden floors. Large open lofts.

Both buildings in their proper business zone.

No. 1 much more expensive to operate than No. 2, because character of tenancy needs much more attention and due to dissimilar size of lofts.

No. 1 has local low pressure heating plant.

No. 2 heated by exhaust steam from freight elevator engines and high pressure throttled steam.

Tenants: Clothing manufacturers and salesrooms for general merchandise.

High Grade Semi-Fireproof Loft Buildings—Freight and Passenger Elevators.

	No. 1	No. 2.
Gross rentable area in square feet.....	40,000	140,000
Cubical contents in cubic feet.....	461,760	1,822,000
Gross rents	\$21,000	\$58,538
Vacancies and loss of rents to gross rents.....	2.4%	1.7%
Cost of engine room labor, repairs and supplies to gross rents		3.48%
Cost of coal and removing ashes to gross rents.....		2.25%
Cost of heat to gross rents.....	3.25%	

	No. 1	No. 2.
Cost of elevator labor, repairs and supplies to gross rents.	6.1%	4.3%
	$\frac{1}{2}$ elevator	
Cost of elevator power to gross rents.....	5.2%	1.87%
Cost of janitor's labor and supplies to gross rents.....	.25%	.24%
Cost of lighting and supplies to gross rents.....	1.4%	.29%
Cost of supervision to gross rents.....	5.82%	2.95%
Cost of building repairs to gross rents.....	3.2%	4%
Cost of insurance to gross rents.....	1.55%	1.79%
Cost of water to gross rents.....	.94%	7.57%
Cost of taxes to gross rents.....	.19%	15.1%
Cost of sundries to gross rents.....	.82%	
Gross cost of operation to gross rents.....	49.92%	28.54%
Net cost of operation to gross rents.....	28.52%	11.74%
Cost of heat per 1,000 cubic ft. of building volume.....	\$ 1.48	
Cost of repairs and supplies per elevator per annum.....	160.00	\$68.00
Cost of electric power per elevator per annum.....	544.50	547.00
Gross rent per sq. ft. gross rentable area.....	.525	.418
Cost of vacancies per sq. ft. gross rentable area.....	.0125	.0071
Cost of engine room light, repairs and supplies, gross rentable area, per sq. ft.....		.0145
Cost of coal and removing ashes, gross rentable area, per sq. ft. ....		.0093
Cost of heat, gross rentable area, per sq. ft.....	.017	
Cost of elevator, lights, repairs and supplies per sq. ft. gross rentable area .....	.032	.0185
	Two elevators	
Cost of elevator power per sq. ft. gross rentable area.....	.0272	.0078
Cost of janitor's lights and supplies per sq. ft. gross rentable area .....	.0013	.001
Cost of public lighting and supplies per sq. ft. gross rentable area .....	.0073	.0012
Cost of supervision per sq. ft. gross rentable area.....	.0304	.0123
Cost of building repairs per sq. ft. gross rentable area.....	.0165	.0167
Cost of insurance per sq. ft. gross rentable area.....	.0081	.0075
Cost of water per sq. ft. gross rentable area.....	.0049	.0024
Cost of taxes per sq. ft. gross rentable area.....	.10	.0632
Cost of sundries per sq. ft. gross rentable area.....	.0043	
Gross cost of operation per sq. ft. gross rentable area.....	.2616	.1615
Net return to owner per sq. ft. gross rentable area.....	.2634	.2565
Percent net return to book value of property.....	3.5%	5.26%

"Vacancies and loss of rents to gross rents." This is an average of the last three years so that they are situated nearly in their proper zone.

"Cost of repairs and supplies per elevator per annum, \$160, \$68." The reason that expense is higher on No. 1 is that the cars have a very hard service in one building. The passenger elevator runs continually from early morning until late at night as fast as it can go, up and down, to take care of the traffic.

"Cost of electric power per elevator per annum, \$544.50, \$547." The cost of that power averages a little over 7 cents, around 7 cents per kilowatt hour in New York. The more we buy the cheaper we can buy it. In other buildings where we give free light, of course we use a large quantity of electricity in a year. 500,000 kilowatt hours in a year is allowed us to make a 5-cent contract. In this case it is a retail power contract, and the rate is a little over 7 cents per kilowatt hour. You can see from these figures that it costs \$550 per year in round figures to operate one elevator for one year in a loft building about ten stories high.

"Gross cost of operation per square foot, gross rentable area." These are interesting figures to compare, where the gross cost of operation is 26 cents in one case and 16 cents in the other, leaving a balance to the

owner, net returns to the owner, 26 cents in one case and 25 cents in the other. In other words, the cost of operations follows very nearly the generally accepted percentage of 50% of the gross rents. So in those loft buildings it costs 50% of the gross rents to operate them, and these figures follow the generally accepted percentage very closely.

Medium Sized, Non-Fireproof Loft Building.

This is the prevailing or common loft building in New York. A great many of them were put up in the '70s and '80s.

Six stories high.

Separate freight and passenger elevators at separate entrances.

Situated on corner of street.

No. 2 situated in better neighborhood for loft demands.

Both sets of elevators electric.

Buildings kept in good condition.

Tenants: Clothing manufacturers.

All power used by tenants purchased by themselves from the street service.

Local low pressure steam heating plant in each.

Medium Non-Fireproof Loft Building on Corner of Street.

Both passenger and freight elevators.

Six stories high.

	No. 1	No. 2.
Gross rentable area.....	25,700	36,000
Building contents in cubic feet.....	372,600	492,000
Gross rents	\$15,600	\$22,700
Vacancies and loss of rents to gross rents.....	19.25%	6.60%
Cost of heat to gross rents.....	3.25%	
Cost of elevator service to gross rents.....	9.35%	7.40%
Cost of public lighting halls, etc., to gross rents.....	.58%	.21%
Cost of supervision to gross rents.....	1.68%	1.92%
Cost of building repairs to gross rents.....	1.56%	4.13%
Cost of all insurance to gross rents.....	2.89%	4.32%
Cost of water to gross rents.....	.78%	.31%
Cost of taxes to gross rents.....	14.10%	20.15%
Cost of sundries to gross rents.....	.25%	1.10%
Gross cost of operation to gross rents.....	55.20%	49.48%
Net cost of operation to gross rents.....	21.85%	22.73%
Cost of heat per 1,000 cubic ft. in building per season..	\$ 1.99	\$ 1.54
Cost of elevator repairs per elevator per year.....	49.50	190.00
Cost of power per electric elevator per year.....	177.00	138.80
Cost of engine room labor, repairs and supplies to cost of coal	8.2%	43.4%
	New boiler.	
Gross rents per sq. ft. of gross area.....	.608	.632
Cost of heat per sq. ft. of gross area.....	.0289	.21
Cost of elevator service per sq. ft. of gross area.....	.0568	.0468
Cost of public lighting per sq. ft. of gross area.....	.0035	.0013
Cost of supervision per sq. ft. of gross area.....	.01	.0120
Cost of building repairs per sq. ft. of gross area.....	.0094	.0262
Cost of all insurance per sq. ft. of gross area.....	.0175	.0271
Cost of water per sq. ft. of gross area.....	.0047	.002
Cost of taxes per sq. ft. of gross area.....	.0855	.1271
Cost of sundries per sq. ft. of gross area.....	.0016	.007
Cost of loss of rents and vacancies per sq. ft. of gross area.....	.1170	.0417
Total cost of operation per sq. ft. of rentable area....	.3349	.3122
Net return to owner per sq. ft. of rentable area.....	.2731	.3198
Percent net return to book value of property.....	4.4%	3.55%

"Gross rentable area, 25,700, No. 2, 36,000." The difference between square feet rentable area in an office building and in a loft building is this: In an office building we measure the actual square feet of floor space, taking out columns, windows, and everything else. It is the actual surface that a man can put his feet on. In a loft building the gross square feet of rentable area is the entire building, including elevator shafts, stairways and light courts. In the loft building proposition it is really the area of the lot that the building covers. Just remember that distinction in speaking of loft building rentable area, and office building rentable area.

"Cost of heat per 1,000 cubic feet in building per season, etc." Why did that No. 1 building cost \$1.99 and the other \$1.54, just alike as two peas? I will tell you why. In one case the boiler entrance is directly at the foot of the elevator shaft. The man in attendance can look after his boiler at all times. He is not far away. He burns a small, hard coal, No. 1 buck and pea, which costs, in New York, for No. 1 buck, about \$3.25, and pea, about \$4 a ton. In the other case we have to burn the large size coal because he is so busy in attendance on the car that he can only take time to fire occasionally, so that he puts on a great deal more coal in one firing and lets it simmer, which you all know is an expensive way to fire any boiler. The figures show what a difference it makes in the percentage how a man fires his boilers, but it is excusable in this case because of the reasons I have just mentioned.

"Cost of power per electric elevator per year, etc." It swings around \$150.

Third Class.

Old style non-fireproof, high class apartment house.

Height seven stories.

Well-built brick buildings on corner of street.

Large well-lighted rooms with high ceilings.

Birch, cherry and mahogany wood trim.

Best hall service. White help throughout.

Elevators: No. 1, hydraulic; No. 2, electric (converted from steam).

No. 1 high pressure. Steam in winter, electricity in summer. Furnishes power, heat, exhaust and high pressure steam.

No. 2 equipped with low pressure boiler.

Buildings are kept in highest state of repair and the service is first class throughout.

Manager and help cater to tenants. Every reasonable wish is satisfied. Tenants remain long time. Very reliable, substantial class. Servants' rooms all grouped together on top floor.

It has been said that by far the greatest factor in the success of an apartment building is the management. It is. I have two excellent superintendents in these buildings that have been there for fifteen years. The tenants treat them almost as members of their own families. There is absolutely no discord. I have a waiting list for both buildings. The loss of rents in one case is absolutely nothing and in the other case it was 1½%. We had a man in one apartment who was in hard luck. He said he could not pay his rent and we released him from his lease. If he had been able to pay his rent we would not have had any loss. As soon as the renting season came around, the first of October or the first of May, I don't remember which it was, we filled up that space.

Old Style Non-Fireproof High Class Apartment House.

	No. 1	No. 2.
Number of rentable rooms (excluding baths and closets)...	96	158
Cubical contents in cubic feet.....	327,900	682,700
Gross rents	\$17,670	\$28,200
Vacancies and loss of rent.....		1.77%
Cost of heat and hot water		6.50%
Cost of heat, power and mechanical repairs to gross rents. 8.02%		.....
Cost of fuel for heat, power and removing ashes to gross rents	7.10%	.....
Cost of elevator service to gross rents.....		4.80%
Cost of elevator labor, repairs and supplies to gross rents. 5.46%		.....
Cost of janitor's labor and supplies to gross rents.....	3.78%	5.97%
Cost of public lighting and supplies to gross rents.....	1.23%	1.80%
Cost of supervision to gross rents.....	3%	6.02%
Cost of building repairs to gross rents.....	11.80%	8.05%
Cost of insurance to gross rents.....	1.44%	1.59%
Cost of water to gross rents.....	.99%	1.24%
Cost of taxes to gross rents.....	9.48%	16.70%
Cost of sundries to gross rents.....	2.89%	3.01%
Gross cost of operation to gross rents.....	55.19%	57.45%
Net cost of operation to gross rents.....	45.71%	38.98%
Cost of heat and hot water per 1,000 cu. ft. per season....		\$ 2.69
Cost of repairs and supplies per elevator per annum.....	180.00	100.00
Cost of janitor supplies to janitor's labor.....		7.3%
Cost of electric power per elevator per annum.....		\$504.00
Cost of mechanical repairs and supplies to coal bill.....		38%
Gross rent per rentable room per annum.....	\$184.00	\$178.50
Cost of heat, power, repairs and supplies per rentable room per annum	27.80	11.58
Cost of elevator service (labor, repairs and supplies).....	10.00	8.60
Cost of janitor service per rentable room per annum...	6.95	10.70
Cost of public lighting per rentable room per annum.....	2.26	3.21
Cost of supervision per rentable room per annum.....	5.50	10.70
Cost of building repairs per rentable room per annum.....	21.60	14.40
Cost of Insurance per rentable room per annum.....	2.66	2.82
Cost of water per rentable room per annum.....	1.83	2.21
Cost of taxes per rentable room per annum.....	15.55	29.80
Cost of sundries per rentable room per annum.....	4.96	5.38
Cost of vacancies per rentable room per annum.....		3.16
Gross cost of operation per rentable room per annum. 99.11		102.56
Net return to owner per rentable room per annum.....	84.89	75.94
Percent net return to book value of property.....	3.95%	5.34%

"Building repairs to gross rents, etc." You see, that swings around ten percent of the gross rent. If you get \$1,000 from a man for a year, to take care of the entire building will cost you about \$100 of that \$1,000 that you receive, although you do not spend \$100 in his particular apartment. That goes to take care of the whole structure as well as the painting and papering in his particular apartment.

Modern Semi-Fireproof, Medium Grade Apartments.

This is the up-town speculative apartment. The West Side is filled with them. They are very popular with the "get-rich-quick" class of people.

Height seven to eight stories.

Electric elevators.

Two baths per apartment.

Colored hall and elevator boys, night and day service. Those boys

are paid \$25 a month. They are cheap. Have to keep at them all the time. Supervision is very necessary. With ten boys we change a boy on an average of once a week. Can't seem to keep them in their place. Get a good man, he goes wrong.

Building in charge of janitor living-in house.

Heated by low pressure steam.

Marble and gilt entrance halls.

Somewhat superficial class of property.

In these buildings the pipes are embedded in concrete, cinders and concrete. Chemical action takes place, the pipes leak, have to tear things up to repair it, which makes the repairs very expensive. A great many people in New York succeed in the clothing business and make a few hundred thousand dollars and immediately invest it in this kind of apartment house; design it themselves, or with the aid of their wives. I want to call your attention to the fact that one building is situated on the corner of the street, which makes it more advantageous to rent the first floor as stores and not as apartments. We can get more rent for the same volume. But in order to consider that building from a comparative standpoint, we disregard the stores and replace the stores with a similar number of rentable rooms, which would have been there if the stores were not. So we still consider the building on a basis of rentable rooms.

Modern Medium-Grade Apartments.

	No. 1.	No. 2.
Number of rentable rooms.....	110	248
Cubical contents of building in cu. ft.....	349,920	701,000
Gross rents	\$15,800.00	\$35,200.00
Vacancies and loss of rents to gross rents..		14.40%
Cost of heat and hot water to gross rents.....	10.45%	5.02%
Cost of elevator service to gross rents.....	6.88%	5.94%
Cost of janitor service to gross rents.....	2.07%	2.04%
Cost of public lighting to gross rents.....	2.11%	3.48%
Cost of supervision to gross rents.....	2.72%	2.59%
Cost of building repairs to gross rents.....	10.10%	11.30%
Cost of insurance to gross rents.....	1.59%	.75%
Cost of water to gross rents.....	2.44%	1.09%
Cost of taxes to gross rents.....	9.70%	13.00%
Gross cost of operation to gross rents.....	48.06%	59.61%
Net cost of operation (taxes) to gross rents.....	38.36%	32.21%
Cost of heat and hot water per 100 cu. ft. of building per season	\$4.80	\$2.52
Cost of heating, repairs and supplies to cost of coal.	37.1%	13%
Cost of repairs and supplies per elevator per annum.	\$155.00	\$143.50
Cost of elevator and house pump power per elevator per annum.....	330.00	415.00
Cost of janitor's supplies to janitor's labors.....	14.1%	19.7%
Gross rent per rentable room per annum.....	\$143.50	\$144.00
Heat rent per rentable room per annum.....	15.05	7.12
Elevator service per rentable room per annum.....	9.87	8.42
Janitor's service per rentable room per annum....	2.94	2.89
Public lighting per rentable room per annum.....	3.02	4.90
Supervision per rentable room per annum.....	3.90	3.68
Cost of building repairs per rentable room per annum	14.46	14.88
Cost of insurance per rentable room per annum....	2.83	1.25
	Meter	Front
Cost of water per rentable room per annum.....	\$ 3.49	\$ 1.16
Cost of taxes per rentable room per annum.....	13.86	19.60

	No. 1. Meter.	No. 2. Front Charge.
Cost of loss of rent, 7 vacancies per rentable room per annum		\$20.15
Gross cost of operation per rentable room per annum..	\$69.42	84.05
Net return to owner per rentable room per annum.....	74.08	59.95
Percent net return of book value of property.....	6.78%	5.95%

When it comes to cost of heating and hot water per 1,000 cubic feet of building for season, you notice that you jump from \$1.37 up to \$2.52 and \$4.80. The reason is that in an apartment house you have to have continuous heat night and day. In office buildings or loft buildings, you have heat in the day time and it is shut off at night. To anybody that buys street service, let me give a little warning. Always insist that your men turn off the heat at night, looking out, of course, that the building does not cool off sufficiently to allow any pipes or plumbing to freeze. Unless you do that you are treating the man who supplies you steam in the flat rate wrong. He will catch you. It will make the general tendency of the price of steam higher because the companies are in the business of selling the steam at cost, plus a reasonable profit. That is all you can ask him to do. Here we are getting a twenty-four-hour heat service, and in the building that I mentioned, one heated with a local plant and one by street service, heat was only supplied about fifteen hours a day and turned off nights and Sundays. So that the cost is about \$1.40 as against \$4.80 and \$2.50.

"Gross rents per rentable rooms per annum." \$143.50 and \$144, respectively. Those two buildings never heard of each other. There has been no comparison between the two buildings before this very minute, and the rents per square foot of rentable area, \$143.50 and \$144 show respectively that there is some system used in the renting department.

Good Grade Non-Fireproof Flats.

Height, five stores.

Construction. Good grade brick tenements, with baths and toilets. Cold water.

No elevator service.

Stores on ground floor which bring up rent average per room.

Janitor service for halls.

Building kept in good state of repair. Flats rent well by good class of mechanics and tradesmen.

This kind of building is generally known as a tenement. It is a case of walk up. Five stories high. The man living on the top floor pays a good rent for the air and light and privilege, but he has got to walk to get it. The construction is a good grade of brick with bath and toilet and cold water. This class was originally built without bath and toilet facilities. They had what they call school sinks in the rear yard. The new tenement house law requires that we put toilets in the house, with running water. We have to light the public halls with gas.

Good Grade Non-Fireproof Flats.

	No. 1.	No. 2.
Number of rentable rooms, equivalent.....	120	111
Gross rents	\$7,661.00	\$7,000
Vacancies and loss of rents to gross rents.....		7.1%
Cost of janitor's service to gross rents.....	4.7%	6.00%
Cost of public lighting to gross rents.....	1.9%	1.5%

	No. 1.	No. 2.
Cost of building repairs to gross rent.....	12.5%	14.8%
Cost of insurance to gross rents.....	1.1%	1.5%
Cost of water to gross rents.....	2.4%	2.1%
Cost of taxes to gross rents.....	15.00%	13.5%
Cost of sundries to gross rents.....	.2%	.41%
Cost of supervision to gross rents.....	5.00%	5.00%
Gross cost of operation to gross rents.....	42.8%	52.00%
Net cost of operation to gross rents.....	27.8%	31.4%
Gross rents per rentable room per annum.....	\$ 64.00	\$ 63.10
Cost of janitor service per rentable room per annum	3.00	3.78
Cost of public lighting per rentable room per annum	1.20	1.00
Cost of building repairs per rentable room per annum	8.05	9.38
Cost of insurance per rentable room per annum....	.70	.94
Cost of water per rentable room per annum.....	1.56	1.32
Cost of taxes per rentable room per annum.....	9.60	8.54
Cost of sundries per rentable room per annum.....	.12	.25
Cost of supervision per rentable room per annum...	3.24	3.14
Cost of vacancies per rentable room per annum....	....	4.50
Gross cost of operation per rentable room per annum	27.47	32.85
Net cost of operation per rentable room per annum.	36.53	30.25
Percent net return to book value of property.....	4.87%	5.15%

In these buildings they have a good grade of mechanics, as I said. That means a man that has got steady work, good pay. In one building they have had absolutely no vacancies for the last three years, and no loss of rents. Every man pays his rent. In the other case we had a vacancy which caused us to have a 7% loss of rent.



The Operating of an Office Building

By J. E. Randell

NEXT in importance to renting an office building is the economy of operation. There is every possibility in this department to misapply an amount equal to a fair dividend. The importance of a thoroughly organized machine, therefore, cannot be over rated.

A superintendent who has had years of experience in handling men and supplies is the best investment a manager can make, and such a man should command a good salary. The superintendent should appoint a foreman for each department under him.

Elevator starter for elevator men.

Day foreman for day employees.

Night foreman for night employees.

Carpenter.

Painter.

Plumber.

Watchmen, day and night.

Stock clerk.

No man should hire or discharge employees except the superintendent. Each foreman should be held responsible for the work of his subordinates. If he is dissatisfied with an employee's work the superintendent should be notified. As a result of this system the foremen will get all the work possible from the employees under them in order to avoid censure.

The superintendent in turn will keep the foremen active in order to avoid the criticism of the manager, who should inspect work as much as possible. Where work is not satisfactory the manager should take up the matter with the superintendent only and leave him to correct the fault. This makes the foreman feel that they must obey the wishes of the superintendent at all times and that he is their only master. Any other course would take away the superintendent's authority and demoralize the service.

Engine Room.

All machinery, the boilers, pumps, elevator mechanisms, steam heating and such other things as pertain to engineering should be in charge of a chief engineer who is not answerable to the superintendent and who reports daily direct to the manager.

In the engineer's room a cabinet should be kept containing all the necessary appliances for first aid to the injured ready for immediate use in case of an accident.

Purchasing.

Neither the superintendent or chief engineer should be allowed to purchase anything for use in the building. When supplies are needed, a requisition should be made to the manager on blanks for that purpose. Nothing can then be purchased without the knowledge of the manager, and he has an opportunity to inquire regarding the items. All purchas-

ing should be done by one man in the manager's office who can keep his price cards carefully posted and placed where they can be referred to at all times by any one in the office.

Work for Tenants.

It is sometimes necessary to change partitions and do other work for new tenants. The cost of all work other than the janitor service done in each room should be entered daily upon cards for that purpose arranged by room numbers in a file. This enables the manager to know at a glance if a tenant is asking too many favors and gives excuse for refusal to do more work except at the expense of the lessee.

Record of Cleaning.

A tabulated book should be kept on which the dates of all cleaning work can be entered, such as floors scrubbed, windows washed, furniture cleaned, vacuum system used, woodwork washed, etc. All that needs to be entered under each heading is the date the work was done. The report of work done should be turned in to the superintendent daily by the day and night foremen on forms for that purpose.

Stock Room.

There is no place where expenses can roll up as quickly as in the stock room. If a card system stock inventory is kept in the manager's office where the stock clerk never sees it and no supplies are given out by the clerk except on an order and receipt from a foreman, and the receipts are turned in to the superintendent every day for entry on the stock cards, there can be no leakage without it becoming instantly apparent. The stock cards can be taken to the stock room and the goods checked at any time. In this way the stock clerk cannot regulate or change the entries on the cards, and a shortage must show at once. The manager, of course, could appoint some one other than the superintendent to check the stock so that a collusion of any party with stock clerk would be shown easily.

Quarters for Employes.

The premises used by employes should, if possible, be in the attic, so that the workmen would not be objectionable to the tenants. The best possible ventilation should be provided. Metal lockers should be used and tables supplied on which lunches can be spread. The women's quarters should be separated from the men's and also equipped with lockers, table and benches. Separate rooms should be provided for the painter, marble and metal cleaners, day janitors, night janitors, calciminers, scrub women, electricians, plumbers and elevator men.

If the building is a large one a carpenter shop should be installed with the necessary machinery to make trim for the building's use. This can be turned to profit by doing work for tenants at their expense. A drying room with steam coils is a necessary adjunct to the carpenter shop and an investment never to be regretted. The carpenter shop will not only prove a great saving in expense of manufacture and a means of giving prompt attention to tenants, but can be made to pay for itself in profits.

Fuel.

Testing coal and selecting the most efficient heat-producing grade is something that interests every manager, and as no two plants are exactly alike, it is most important to select the coal which will be economic in handling and will give the least possible ash for the greatest evaporative strength.

Uniform Keeping of Cost of Operation

By Charles F. McBride

THE problem of uniform keeping of cost of operation, accessories, cost of supplies and advisability of making comparisons with other buildings is one of the most important with which building owners and managers have to contend, as well as all other classes of business men.

There is nothing more essential than accurate cost records, not merely to show the aggregate cost of materials purchased, cost of repairs, improvements, etc., but also the proper accounts to which distribution should be made, in order that owner, or manager, may be able to ascertain at a glance any increase in operating expense, and call to account those responsible.

In this connection it is my purpose to suggest the keeping of such records as are the most simple and thorough, and I consider a cash book, ledger, voucher record and auxiliary ledger sufficiently comprehensive for all purposes. Cash book will show receipts and disbursements; ledger, the accounts to which chargeable; voucher record, the pro rata amount of voucher to be charged to each department, and auxiliary ledger the itemized description of each purchase, or expenditure. A journal may also be used to take care of anything other than cash, and correct errors in distribution.

The following accounts, sub-divided as noted, I believe, will suffice for the ordinary building, viz.:

Building Repairs.

Repairs to walls and ceiling, refinishing wood work, plastering, exterior of building, alterations, etc.

Electric Machinery Repairs.

Engines, generators, switchboard and conductors, etc.

Elevator Repairs.

Valves and cylinders, ropes and cables, cages, hydraulic piping, etc.

Fuel.

Gas, coal, hauling, ashes, etc.

Wages.

Mechanical, janitor, elevator, watchman, painter, carpenter, etc.

General Expense.

Watchman and fire alarm, hauling garbage, boiler inspection, laundering, advertising, furniture and fixtures, etc.

General Repairs.

Steam fitting, steam heating system, boiler repairs, stoker repairs, refrigerating plant, etc.

Office Expense.

Salaries, stationery and printing, telephone and telegraph, postage, etc.

Plumbing Repairs.

Wash stands, toilet rooms, etc.

Taxes.

City, county, water, state.

Janitor Supplies.

Soap powder, soap, brooms, brushes, mops, dusting cloths, disinfectants, toilet paper, etc.

Engineer's Supplies.

Steam packing, hydraulic packing, waste, various kinds of oils, ammonia, calcium, boiler compound, tools, etc.

Electric Supplies.

Lamps, lamp shades, switches, sockets, fixtures, etc.

Elevator Machinery.

Sheaves and bearings, hydraulic packing, valve cups, operating cables, main cables, etc.

Vacuum Plant.

Electric motor, vacuum pump, hose, etc.

Ventilating System.

Electric motor, air ducts, etc.

Revolving Doors.

Electric motor, gears and bearings, weather strips, etc.

Hot Water System.

Filters, pump, heater, etc.

Drinking Water System.

Filters, sterilizers, cooling tanks, etc.

Water System.

Deep well pump, rods, piping and valves, etc.

Legal Expense.

Attorneys' fees, damage and settlements, etc.

Insurance.

Fire, boiler, elevator, plate glass, employers.'

In order to simplify matters in the distribution of cost, a key to the distribution of accounts should be prepared and superintendent should note on invoice the account and sub-division to which supplies or repairs are chargeable.

The question of preparing such a key is a simple matter, and I know of no better way than using letters of the alphabet to designate the account, and numerals to signify sub-division to which chargeable; for instance, the account of wages may be given letter "A" and be sub-divided from number 1 to 20. A-1 would designate mechanical, A-2, janitor; A-3, elevator, etc.

Letter "B" would designate engineer's supplies, and would commence with number 21 and close at, say, number 40.

Letter "C" would designate janitor's supplies and start with numerals 41 and end with 70.

Letter "D" would designate building repairs, and first number start with 71.

This plan can be carried out indefinitely, and it is a simple matter for manager, or superintendent, to note on invoice or duplicate of order the letter of account and the sub-division to which chargeable; for instance, on an invoice for soap, C-30 would be noted, the letter designating the account to which chargeable, and the numeral the sub-division.

In addition to the foregoing cost system, a ready reference should be kept by manager, or purchasing agent, from which they could tell at once whether supplies were being used judiciously, and also if cost of any particular repairs were excessive, and thus institute an investigation to ascertain the cause. This may be accomplished by a system of card records, having a separate card for each item; for instance, in the case of oils, a card for each kind should be kept and entries made thereon showing date ordered, quantity received, from whom received and cost of same. Upon receipt of requisition from superintendent, all that is necessary is to refer to card and ascertain when last supply was purchased. Should record show that within a short period a supply of such oil had been furnished, the matter could be taken up at once, and an investigation instituted to ascertain whether oil had been wasted, or was of an inferior quality. In either case, the investigation would result in such action as would prevent a recurrence.

Too much importance cannot be placed on the question of keeping ready reference costs, as it is of the utmost importance that person in charge of building should be cognizant of what is going on, and have his records up to the minute.

As the thousand and one things needed in a large building, or number of buildings, as the case may be, require the strictest attention the object in having ready cost reference permits the owner, manager or purchasing agent to detect a leakage before it has assumed serious proportions.

In view of the fact that it requires a uniform system in conjunction with keeping of cost records, I will explain what, to my mind, is as simple and accurate a system as can be devised.

To commence with, it should be the duty of the superintendent to make requisition for supplies or repairs on a proper form provided for that purpose, which form should be in duplicate. The original to be sent to manager or purchasing agent, and duplicate retained for the purpose of checking upon receipt of supplies, or completion of repairs.

The manager or purchasing agent in turn should issue order on source from whence he can secure the best price (quality always being considered).

Order should be issued in triplicate. The original to be sent to the firm, or manufacturer, duplicate to superintendent and triplicate retained, in order to note thereon the date that bill was passed for payment, and the amount of same. The duplicate should be sent to superintendent immediately upon issuing order, and retained by him until receipt of goods, or completion of repairs, and then certified by him as to quantity and quality, etc. The account to which chargeable should be noted thereon and duplicate returned to manager in order that bill may be passed promptly.

The subject of accessories is a rather difficult matter to handle, as so many different appliances and devices have been invented, and it would be exceedingly difficult to numerate them, hence, I would prefer to consider the matter from an efficiency and cost basis, or from the standpoint of an investment.

Many manufacturers and dealers permit their wares to be given a certain trial, say 30 days, to demonstrate their merits. If the device be a labor saving proposition, a strict record should be kept of the amount of time saved, the saving in cost of labor and the probable cost of repairs.

¶ a material saving device, a strict account of consumption of mate-

rial should be kept. Should the consumption be decreased to an extent to warrant the purchase of same, it would be considered a good investment. Here again is where the cost system is an invaluable aid. It can be referred to and the decrease noted.

In my experience I have found that it is good business to investigate all claims of manufacturers of accessories and permit demonstrations to be made, and I have in mind a number of exceedingly good investments we have made as a result of such tests, which have materially decreased our expenses.

The subject of cost of supplies and advisability of making comparisons with other buildings I consider a very important matter, and my method of taking care of the cost question is by keeping record on cards, as before explained, and as in the case of accessories. I strongly recommend the trial of any article for which merit is claimed.

In order to illustrate my point in this respect, I will cite but one instance, and as an example, we will take the supply of waste. A card is made out, headed "Waste" and entries are made thereon showing date ordered, amount received, cost of same, and from whom obtained. Purchases are made from a certain firm, and consumption is increased to such an extent that it is deemed advisable to make a change. Card will show the amount purchased and the cost of same, and when change is made, the name of new firm is inserted in proper column, and it does not require long to ascertain whether change was advisable, as card will show at a glance whether expense for this supply has decreased or not.

Not only are such records invaluable for such purposes, but call attention to the excessive cost of any certain supply, and investigation can be made and in a great many instances a substitute provided which will materially reduce the cost.

Practical experience in buying and keeping cost records has taught me that the question of quality in at least 90 percent of cases is economy.



PART V

Janitor Service, Etc.

Efficiency and Cost of Janitor Service

By Albert Kern

THE figures which I have compiled are necessarily but estimate. Location, class, size and style of building, make up of janitor force, and the amount of work they deliver, and the quality of it, also organization, and methods, are what produce the results.

The selection of help is an important factor. Weed them out; get a force together that will work well in harmony, treat them all fairly, but impartially. Hire everybody on probation. Get as many as you can with a smile. Select good cleaning materials. Test them, and try them out. It is a common failing with the average janitor force to make a scapegoat of the cleaning materials supplied them by the building. Many times their complaints are well founded, for the maximum amount of work cannot be secured by inferior supplies. Proper materials with a good, husky man behind them make a good dirt-fighting machine. Therefore, it behooves the up-to-date manager to use discretion in his purchases, and thoroughly try them out. For example there are many powders on the market for the cleaning of marble and corridor floors. They all have some good points, and after a careful examination will be found to have marked individual qualities for various kinds of work that it will take some time to find out. Select the one that works the best for your conditions, and school your janitors in the use of it. It is not sufficient to turn your material over to them, and work out their own salvation. Help them along by a little intelligent direction.

In a sample test not long ago, the writer noted the results of a competition by two gangs of men on the same kind of floor surface, using two different compounds; while the actual cleaning results were identical, the men using one material beat the others out in speed on account of their compound working more freely, that is, there was less floor and mop resistance, which is quite a factor, as naturally the percentage of energy consumed has a bearing on the amount of labor a man can do.

In the above instance the results of cleaning say 35,000 to 40,000 feet of surface per night would amount to a very perceptible saving in labor and material.

By this same token the selection of mops of which there are many and various makes and kinds, wringers, chamois, sponges, etc., etc., requires much intelligent selection, and once having adopted them, school your force in their use, and your burden will be considerably lessened.

Janitors vs. Janitresses in Care of Offices.

With the view of getting some light on the subject of Janitors vs. Janitresses, in the care of offices, I sent a number of inquiries around the country, with the following results:

	Square Ft.
Chicago (men preferred)	1,234,397
Chicago (women preferred)	598,846
New York (women preferred)	500,000

Cleveland (women preferred)	125,000
St. Louis (women preferred)	122,000
Toledo (women preferred)	200,000
Indianapolis (women preferred)	81,000
Milwaukee (women preferred)	80,000
Minneapolis (women preferred)	100,000
Terre Haute (women preferred)	31,000
Rochester (women preferred)	35,000
Pittsburgh (women preferred)	150,000
Kansas City (women preferred)	100,000
Detroit (women preferred)	800,000
Seattle (men preferred)	71,000
Memphis (men preferred)	52,000
Tacoma (men preferred)	46,000
Columbus, Ohio (men preferred)	60,000

Rental area 4,386,243

So, out of a total of 4,386,243 square feet of rental area, selected from seventeen cities, about 67 percent favored women. Outside of Chicago, the percentage in favor of men was about 9 percent.

In Chicago out of twelve chief janitors interviewed, representing 1,833,243 square feet of rentable area, six representing 1,234,397 square feet, or approximately 67½ percent were in favor of janitors, and six, representing 598,846 square feet, were in favor of janitresses.

The argument in favor of janitors was that they were stronger to move furniture about, worked longer hours, were more amenable to discipline, and proved cheaper from additional quantity of work done. Women were used for scrubbing and polishing only.

In favor of janitresses was that, working six or seven hours, they did as much work proportionately as men, were naturally neater and more careful, and gave cheaper and better service than men.

It was noted that the larger buildings of, say 200,000 feet and over, were almost unanimously in favor of women janitors.

Personally, I cannot speak of experience with men in the cleaning of offices, but have given the matter some study, and see no good reason for changing from women to men. Women are naturally better adapted to the work. Given a good forewoman and shorter hours, they can almost hold their own with men, and the work done at marked saving in wages. This, of course, refers to location where women can be reasonably hired. There are some sections where they cannot be secured on these conditions. True, they cannot be held to the same exacting discipline, and are occasionally sick and absent, but it has been demonstrated that three women working five hours each, can do as much work as two men working 9½ hours each, at a saving of approximately 25 percent in wages.

The following replies are all from Chicago: The first is a building of 60,000 square feet. The manager says: "I do not care to have the women do sweeping and dusting, for three reasons: First, they cannot move furniture as well; second, they are more subject to sickness and absence; third, it is more difficult to maintain the proper discipline over women."

The following is from the manager of a building containing 60,000 square feet: "Women do their work better and neater. They are less destructive to furniture and tools, and will do as much work per hour as the men. Women, by home training, are better fitted for their work, and if carefully selected, will give much better and cheaper service than men."

The next building contains 85,000 square feet: "On the present basis of wages in Chicago, do you consider it practical or desirable to employ women to do sweeping and dusting?" "Yes. Three women working five hours each (15 hours) will accomplish more and do their working better than two men working 9½ hours each (19 hours), and the difference in the pay will show a saving of about 25 percent. It costs me 14 cents per square foot of rentable space for all labor, materials and supplies."

The next building has 160,000 square feet. The manager answers the same question, "yes. If not overworked, they do their work with more care, and will give better service. In smaller buildings where high-class service is not required, men can cover more ground and do more odd jobs, therefore are more desirable; but in a building like this I can get better and cheaper results with women."

The next is a building of 125,000 square feet. The manager prefers women for sweeping and dusting. He says: "Sweeping may be done by women just as well as by men, provided the hours are not too long. Women usually have a lot of home work, and are not, as a rule, capable of doing more than six hours' office work."

The manager of a building containing 156,000 square feet has this to say: "Good men are scarce. Women do not need to be taught how to sweep and dust. They have had the necessary experience at home. The average man knows nothing about sweeping, dusting or scrubbing. If you employed a man and his wife to work for you, would you send the man into the house to sweep, dust and care for the baby, and the wife to dig in your garden, take care of your horses, etc.? You would never think of doing that, and you know why."

The next building has 194,000 square feet, and the manager says: "Women are very undesirable for sweeping and dusting, and you cannot keep proper discipline over them. When I took charge of this building, women did all such work, but I at once changed to men, and inside of a week the tenants began congratulating the management on the change. Women are best for scrubbing, but that is all."

The next building contains 204,000 square feet. The manager prefers men. He says: "On account of absence through sickness of themselves and family, I do not consider it practicable to use women for sweeping and dusting in large buildings."

The next building has 350,000 square feet. The manager prefers men, and says: "We found that we saved \$1.18 per floor per night by using men. This makes a saving for us of approximately \$8,000 per year. Women cannot move desks and other heavy furniture, and lose too much time in trying. The men are worth more than the extra 2½ cents per hour."

Hours and System of Operating a Janitor Force.

Hours, systems and methods of operating a janitor force depend wholly on the type and size of building, so that the only way to open a discussion is to outline one way for a building of about 150,000 square feet rentable area, and draw the fire.

The janitors should have a room equipped with metal lockers, table and chairs or benches, with proper light and ventilation. This room is located to the best advantage in the attic. It should be kept clean and properly painted or calcimined and therefore wholesome. A mute reminder of cleanliness and order.

The janitresses should also have a like equipment distinct from the janitors' room.

The painters and carpenter should also be provided with working quarters.

The elevator operators are best housed in the basement, with a room of good size equipped with table, chairs and lockers, and a sofa, to be considered as an adjunct to a Red Cross cabinet, in which are kept all the necessary appliances for offering first aid to any one injured. A shower bath and toilet room are used jointly by the engineers and elevator crew.

The chief janitor is in charge of the janitor force, and hires and discharges them. He is held responsible for this work. He is in the store room before the night force comes on duty ready to give out the supplies, keys, etc., and issue instructions or orders.

The offices are cleaned by janitresses, who work under a forewoman as follows: Mornings, 5:00 to 8:30; evenings, 5:00 to 9:30, working 7½ hours. Scrub floors twice a week. Sweep out every night. Set waste paper baskets and cuspidors in corridor for cuspidor men. Mornings, dust and return baskets and cuspidors to proper places.

Cuspidor and waste-paper men work, a. m. 5:00 to 10:00; p. m., 4:30 to 9:00. Clean cuspidors evenings, remove waste paper mornings; clean polished brass work, signs, fire hydrants and wash down sidewalks every morning, also clean janitors' closets.

Corridor men work 4:30 p. m. to 2:00 a. m. Sweep and mop corridors and janitors' closet floors, also main entrance lobby, and stairs and landings from main lobby.

Porters, 6:30 to 5:00, one-half hour for lunch. Rub down woodwork and marble wainscoting. Scrub all stairs except first floor. Clean transoms and inside partitions. Clean down elevator shafts. Operate vacuum cleaning apparatus, mornings from 6:30 to 8:00.

Window washers work 9½ hours, beginning the day, during hot weather, at 5:00, other times later, till 6:30, according to light and season. In bad weather clean transoms and glass of inner partitions. They turn in daily reports of all windows cleaned which are verified by the chief janitor, and in turn by him given to the manager, who is thus thoroughly in touch with the work.

Colored porter in men's toilet works from 7:00 to 5:00. Scrubs floors, rubs down all woodwork and marble. No other duties outside of room. Keeps closets flushed.

Colored maid for ladies' toilet, 7:00 to 4:00. Cleans and scrubs toilet and rest room, makes hourly visits to keep it in order. Cleans all marble drinking fountains.

We furnish filtered ice water to all tenants, two fountains in each hall. We have a building of about 162,000 feet rentable area.

Painters, 6:30 to 5:00. One-half hour for lunch. Varnish floors, decorate rooms, do all painting. Head painter acts as assistant to chief janitor.

A janitor is detailed for Sundays as a special officer, patrols building, sweeps out corridor and preserves order.

Carpenter engaged from outside at stated price per hour.

Watchman, 5:30 p. m. to 6:30 a. m. Runs elevator at night after operators quit at 10 p. m. Regulates lights, patrols building, preserves order. Keeps time of employees.

Amount of Work Required.

In advancing any figures relating to the amount of work a janitor or janitress can do, only a very general line of action can be arrived at at the best, as each building must be analyzed and operated according to its individual character, size, construction and class, also local labor conditions govern largely the amount and quality of the work. One rule cannot be too strongly urged, and that is systematizing the work. Much more can be accomplished by laying the work out carefully, so that the help become more expert and can do it better and faster.

Under average conditions, one window washer can clean approximately 50 windows, 48x39 each sash, or 1,300 square feet per day of 9½ hours.

Scrub approximately 1,300 square feet marble stair treads.

Janitor can clean approximately 2,200 square feet transom and partition glass in 9½ hours.

Scrub approximately 1,300 square feet marble stair treads.

Sweep, then mop, approximately 9,000 square feet marble corridor floor tile.

Clean and polish approximately 28 assorted cuspidors per hour.

Rub down approximately 4,800 square feet woodwork, as transoms, doors, rail, etc.

Rub down approximately 5,000 square feet marble corridor wainscoting.

A janitress can care for properly 6,000 square feet of office space containing 47 desks, 18 tables, 123 chairs, 25 bookcases, each office scrubbed twice a week, also clean 79 chandeliers and side fixtures, in 7½ hours; 123 cuspidors and 30 waste baskets cleaned and emptied by janitors.

Cost of Janitor Service Per Square Foot.

Windows glass cleaned at approximately .078 per square foot per annum, cleaning windows about once every eight days.

Windows, transoms and door and partition glass cleaned at approximately .063 per square foot per annum. Inside glass cleaned about twice a month.

Transoms, doors and partition glass cleaned at approximately .019 per square foot per annum.

Marble corridor and bank floors are cleaned at approximately .089 per square foot per annum.

Marble floors, toilets and wainscoting, stairs, corridor woodwork are cleaned and rubbed down at approximately .075 per square foot per annum.

Marble wainscoting is cleaned at approximately .008 per square foot per annum, twice a month.

Marble stairs are scrubbed at approximately .21 cents per square foot per annum.

Cuspidors and waste paper cleaned and removed at approximately .012 per square foot of rentable area per annum.

Corridor woodwork rubbed down twice a month at approximately .088 per square foot per annum.

Janitor service in offices is estimated at approximately .077 per square foot of rentable area per annum, exclusive of windows. Inclusive of windows, .09 per square foot.

Janitor service exclusive of windows for an average office of approximately 300 square feet is estimated at \$23.00 per room per annum.

Janitor service, inclusive of windows, is estimated at approximately \$27.00 per room per annum.

Janitor service, including corridors, stairs, windows and entire cleaning, is estimated at 14c per square foot of rental area.

Checking Supplies Used by Janitors.

All janitors' supplies should be kept in the stock room, preferably located in the attic near the janitor's quarters, thus making it easy of access to the entire force. The chief janitor has the only key for this, and keeps it in order and receives and delivers all supplies.

One system to keep a check and record of supplies is the following:

All supplies are purchased by the manager on requisition from the chief of the department. Then placed in the stock room, and are issued to the janitors when called for, on delivering worn-out old ones. A complete inventory is taken monthly, which gives a complete check of goods purchased and consumed. The orders are made out in triplicate, one given to firm from whom supplies are purchased, the chief keeping the second, and the third kept on file in the office. When goods are delivered they are received, and O. K.'d by the chief, who then turns in his copy of order duly O. K.'d. Then bill is transferred to card with quantity and prices to be checked off, when monthly inventory is taken.

Another way is to keep a card in the stock room, whereon all purchases are entered daily with date of receipt, and consumption, thus keeping a complete daily or perpetual inventory.

Some managers operate their force by using a time clock, and designating the janitors by numbers. When supplies are issued the articles are entered in a supply issue book against the employee receiving them, also a monthly stock book showing goods used and on hand.

There is a point there regarding the use of a time clock for employees. Personally I have not become educated to it, and I cannot see it. I will have to be shown where it is going to work out much better. It gets up against a phase of human nature which is peculiar. Your men are made machines.

Practical Rules and Regulations for Operation of Office Buildings.

Rules and regulations for the janitor force:

1. Do not loiter around lobby, entrance, stairways or corridors when off duty.
2. Politeness and civility to tenants must always be observed.
3. Attend strictly and quietly to your duties. Visiting around the premises is not permitted.
4. The night watchman is the custodian of the building at night, report all trouble or irregularities to him.
5. Intoxicating liquors must not be brought into the building.
6. Smoking is not permitted while on duty.
7. Report suspicious persons or strangers at night to the watchman.
8. The removal of papers, books, or any article whatsoever is not permitted without an order from the office.
9. Fire extinguishers are located in all fire hose closets, next to the south stairways, also in attic and basement. Use promptly when necessary.
10. Awnings should be raised every night.
11. Report leaks in water pipes, radiators, or other trouble promptly.

12. The toilet rooms of the building are for the use of the tenants only and must not be used by employees.

13. Be sure that office doors are locked, lights out, and windows closed when through with work.

Rules and Regulations for the Janitresses.

1. The hours of work will be from 5:00 to 8:30 a. m.; 5:00 to 9:00 p. m.
2. Janitresses are expected to attend to their duties themselves without outside assistance.

3. Visitors, children and callers will not be allowed on the premises.

4. Janitresses must stay on their own floors. There is to be no visiting to other floors.

5. Attend to your own work promptly, quietly and carefully, and mind your own business.

6. Be economical with electric lights, also lock doors when through and see that windows are closed.

7. Report leaks or other trouble at once.

8. Allow no one in a room unless sure they are tenants, and only when they have a key.

9. Report at once all suspicious persons loitering about the building.

Rules and Regulations for the Operation of Elevators.

It is the earnest wish of the management to make this service of the best possible character, and the strict observance of these rules will greatly help to attain this end.

1. Report all defects of cars and machinery to the starter at once on discovery of same, and note that repairs are attended to.

2. Elevator conductors must close their doors before starting cars.

3. Avoid overcrowding cars. Keep passengers clear from gates and operating lever.

4. Uniforms are to be worn at all times when on duty.

5. Do not loiter around lobby, entrance, or stairways, unless on duty.

6. Personal cleanliness, neatness, courtesy, and politeness will do much to improve the service.

7. Look out for the peddlers, beggars, distributors and suspicious persons, and report same to the starter.

8. Office furniture and other heavy articles must not be taken from the building, except on presentation of permit secured at the office.

9. Fire extinguishers are located in the fire hose closet next to the south stairway, in the starter's room and in the basement.

10. In case of a burning awning, or other fire, report it to the first janitor seen, or to the starter. Act quietly and promptly.

11. Turn out lights in starter's room when not in use.



Janitor and Elevator Service

By C. S. Hughes

THE buildings of the Chamber of Commerce consist of three distinct units. One of them is a five-story, non-fireproof building, erected twenty-seven years ago, of mill construction type. The floors of the corridor are wood, and the wainscoting also. The second is a fireproof building, ten stories high, and modern in every respect. The third is of concrete construction, twelve stories in height, and also modern in every way.

These buildings have a population of about 1,400. The tenants are practically engaged in one line of business, that of grain merchants along some of its lines. This brings about one of our problems. The samples of grain brought into the buildings, taken in the aggregate, make a total during the year of 10,000 bushels. This makes a large amount of dirt, and where tenants are careless in permitting accumulation of grain samples on the floor in corners, a breeding place for mice develops.

In considering the subject of janitor service, this naturally divides itself under four headings: Offices, Corridors, Toilet Rooms and Windows.

Before considering these headings, there is one point which every manager has to contend with, and that is the class of men who work as janitors. They are usually men past their prime, or else young men who are unable to do anything else.

Our office cleaning is done by women. Each woman cleans about 7,500 square feet. They work between five and six hours a day. This is divided into two shifts; one in the evening from six to nine, and one in the morning from five to seven and up to eight a. m. The floors are swept and waste baskets dumped at night, and the dusting and tidying up is done in the morning. We tried working straight through in the evening, laying off for a time to allow the dust to settle; but this was not satisfactory, as we found that there was another accumulation of dust in the morning. Personally, I believe that we would secure better satisfaction to put on a crew of men to do the sweeping and cleaning, and have women to scrub in the good old-fashioned way; the men to work throughout the night, with a lay-off at midnight, and then dust.

Each office is mopped at least once a week. One great trouble we have is in the janitors shirking the moving of the desks. A woman is unable to move a great many, as they are too heavy, and to save time for herself she is apt to fail to call on the head janitor for aid, and there is an accumulation of dirt under every one of the desks. That is where these new sanitary desks have the advantage. To help us keep track of this desk moving, we have a form for the janitors, to show the offices scrubbed and the desks moved.

Vacuum cleaners do not do the business in our buildings on account of the grain. We have tried out the portable vacuum cleaners in offices where there are no grain samples, but we found them a failure, as they will not stand up under the usage they get, and are a source of trouble for the

electrician. A central plant in a building piped where the mechanism is under the control of your engineer would probably work better, but I have understood that these cause a great deal of trouble.

Tenants can help a great deal in janitor service by keeping furniture free from papers, and not allowing piles of stationery in the corners. It is noticeable that where tenants are neat, that the janitor service is a great deal better than where they are careless and slovenly.

Our supplies for the janitors are kept by the storekeeper. Each janitor is supplied with a locker, to which he or she and the head janitor only have access. Supplies are only issued on the return of the worn-out articles.

Painting is a great expense of janitor service in an office. The building must be gone through at least once every three years. As a rule paint will stand two washings, and we can get away with it, providing the ceilings are all right. For a standard color, we have been using a greenish gray on the walls and a white ceiling. This we have found very satisfactory.

Our cost of janitor service in the offices is 5.7 cents per square foot of rental space.

Our hallways are cleaned by men exclusively and the mopping is done at night, except in the old building, which is mopped in the daytime. On the wooden floors in the old buildings we use a bleaching soap, which helps to keep the wooden floors lighter in color, and takes away that dark color which comes from a flaxseed or gold dust soap.

We have not found it economical to use a high-priced soap, as it seems to take about as much soap anyway. The dusting and the cleaning of the marble are done in the daytime. The ground floor corridor is swept during the day, but we aim not to have men around cleaning any more than is necessary during the day.

Our cost of cleaning hallways is 4.9 cents per square foot of rental space.

Our buildings are planned with a toilet room on each floor. This increases our cost of maintenance, towels, soap, etc. We also provide a rest room for the use of the women employed by the tenants throughout the building. This room is in charge of a matron, who also takes care of the ladies' toilets throughout the buildings.

All the toilet rooms are also mopped at night, and one man is kept making trips throughout the buildings during the day cleaning everything as thoroughly as possible. We use roller towels. These towels are changed in the morning, and again after lunch. They are at all times reasonably presentable and fresh looking. We have tried out the paper roller towel, and outside of their giving each individual a fresh towel, we can see no advantage. As far as cost goes, there is no saving to the building over the roller towel. We also use a cake soap.

The cost of toilet room service, including soap, towels, etc., is 2.1 cents per square foot of rentable space.

One of the most important parts of the janitor service is the window washing. By this I mean both inside and outside glass. If your corridors are clean, and your elevator service excellent, and your general janitor service good, but the windows are dirty, a poor impression is created of your building. We keep two men employed all the time, and two others part of the time at this work.

An immense amount of waste paper is taken from each office every day. This paper is taken care of by a helper to the head janitor at night, and is taken to a room where it is baled. We formerly sold the paper merely

sacked. The great trouble with this method, besides the fire risk, was that one never knew how much he would receive from it till the check came in. After we bought our baling machine we made a deal with a paper company to buy our paper on the basis of our weights at the building. This has been very satisfactory, as it has done away with all disputes as to weights, and enables us to keep an accurate record of this item. Paper at the present time in our city is bringing \$7.00 per ton.

This drinking water problem is one that is a source of trouble to nearly every building. The water in our city mains is taken from the river, and while the city authorities say it is all right, still no one cares to drink it. The result is that several companies are engaged in supplying spring water in our city. Our well water is such that it cannot be used in boilers, and if we had a well, it would mean a separate system for drinking water purposes, which would mean a very great expense.

There is also a very proper agitation sweeping over the country against public drinking cups, water standing in coolers with ice in it, etc. We had these tanks of ice water standing in each corridor, and besides some of the offices had their own individual coolers. This resulted in four different companies delivering spring water to the building. They came at different hours and bothered our elevator service, and slopped water in the corridors, and were otherwise a nuisance. Finally, we took the coolers out of the halls, and made a deal with one of the companies by which we rented them space in the basement of the building for a store room and an ice box. As these people could give the service, it resulted in their securing a monopoly of the water supply in the buildings. They kept a man at the buildings all the day. He makes a trip early in the morning, before the tenants arrive, cleans the coolers, replenishes the water and ice. They use the bottle cooler. He also empties the waste pans of the coolers. When a tenant desires water, if it should run out during the day, he merely telephones the building office and the order is turned over to the water man, and the tenant is taken care of at once. This has worked very satisfactorily. One would not know that a water business is being carried on.

Elevator service of the most efficient type is required in modern office buildings. Tenants are very irritable and will stand for nothing but fast, prompt service. And while cars are traveling at a high speed, they must travel smoothly, and give no cause for anxiety on the part of the tenant. As in every mechanical plant, the human factor entering into the maintenance and upkeep after the first installation is of the most importance. With the plunger or high pressure hydraulic, the responsibility rests first on your engineer, and with the various electric types with your electrician, and then with your operators. So, first have your operating machinery in A-1 condition when the car is turned over to the operator, then you have the responsibility placed on the operator. Your starter must be a man of sufficient executive ability to keep the boys going, and not to allow any loafing. Your actual service will not be any better than the point of efficiency to which you can key your starter.

Signal devices are a great aid to service in banks of elevators. The operators must be compelled to operate by the signal. If the operator ignores the signal, and goes back and gets someone, who calls up or down without using the signal, you will soon commence to receive complaints about like this: "Operator on car No. 5 ran by men," etc.

Keep your cars clean, both the floor and the iron work. Allow no ad-

vertisements in the car. Keep a set of rules, made as few and simple as possible, neatly framed in the car where they may be seen plainly. Our rules merely cover the points that no conversation with passengers on the part of the operator, and vice versa, is permitted; passengers must call their floors; that a car will not return to a floor after passing same.

The operators should be neatly uniformed. They must be compelled to keep their uniforms clean, and not allowed to wear them on the street.

Passengers are careless, and a great many elevator accidents are caused by this; in fact, a very large percentage. The operator should see that passengers stand with their faces to the door, and not their backs, as they are liable to lose their balance and fall to the front of the car.

Our having three distinct units in our buildings results in our having three sets of elevators. Each set is of a different type. As far as economy of operation is concerned, this is an error, but in one way it is a good thing. It enables us to start a man in the old building and promote him to the annex, and then to the main building, as vacancies occur.

The old building has the Otis worm-gear electric system, operated at a speed of 250 feet per minute. The annex has the Otis 1:1 traction car, and the main building high pressure hydraulic system.

In regard to the cost of service on various types of cars, as stated above, our buildings have each a distinct type. The figures of cost given are based on coal costing \$4.10 per ton, and electric current at \$.0146. The worm-gear cars operate at a speed of 250 feet per minute; the height of the wall 60 feet; the mileage 22 per day; kilowatts per car mile, 3.17; cost per car mile, \$.046.

Current cost per car mile.....	\$0.046
Repairs .....	.016
Wages .....	.166

Total.....\$0.228

The high-pressure hydraulic cars, operated at a speed of 550 feet per minute, with a wall of 126 feet high, are operated by steam pumps. Car mileage, 135.73 per day; allowing for proportionate cost of labor in the boiler room, and for the cost of water.

Power cost per car mile	\$0.062
Repairs cost .....	.025
Wages of operators .....	.127

Total.....\$0.214

The power cost is figured with an allowance for exhaust steam used for heating. During the heating season, 70 percent should be deducted for exhaust steam thrown into the heating system.

The 1:1 traction cars show as follows: The height of the wall is 150 feet and the speed is 400 feet per minute. Mileage per day 40.

Kilowatts per car mile.....	6.23
Cost of current per car mile.....	\$0.091
Repairs .....	.048
Wages .....	.130

Total.....\$0.269

These cars are not designed for a building with local service. They are

a success where used for express service, but the starting load is too great for a local service.

We have had a great deal of trouble with these cars, and our cost of operation and repairs were so great, and the cars were out of commission so much that we took the matter up with the Otis company. After looking the system over, they reduced the weight of the counter-weight 688 pounds, thereby reducing the speed about 25 percent, and also the current consumption the same amount. So far they have given no trouble. This brings the current consumption down to 4.7 kilowatts per car mile, or about 6½ cents. As these cars have not been operated a sufficient length of time since, am not able to give repair cost per car mile.

Through the courtesy of Mr. VonKuster, of the Security Bank Building, of our city, the following figures of the cost of operation of the plunger type are given:

The figures are on a basis of coal costing \$3.90 per ton:

Power cost per car mile.....	\$0.075
Repair cost .....	.011
Wages .....	.128

Total.....\$0.214

In conclusion, it may be said that if a building has the finest construction, and the most complete equipment, it will not be a success unless it gives the service. Buildings are erected to pay dividends, but the service must not be skimmed to pay the dividend. When the tenant comes in the morning, the elevators must be ready to give him quick service, his office must be in shape to use, and the less the tenant has cause to notice, except that everything in the way of service is there when he wants it, the better the service is.

A business man spends a greater proportion of his time in the office than anywhere else, and he is entitled to spend that time as comfortably as possible. Therefore keep your service up to the highest efficiency possible.

I have in mind a building which from its location and its construction, both in economy of space and in its well-lighted offices, still has great difficulty in renting space and holding tenants after securing them. Through a false idea of economy, the main entrance is dark and uninviting, the floors and wainscoting of the corridors are dirty, the windows—best drawing card of the building—are not cleaned often enough, its elevator service is poor. The building has not been paying from an investment point of view. The first remedy tried by the management, in its effort to fill the building, was the reduction of the rental schedule. Now it is a second-class building, while if it had given the service, although costing a little more, it would have been made up in increased rates of rental.

In contrast to this, I have in mind another building, built in out-of-date matter, with wide hallways, making a low percentage of rentable space to total space in the building, offices poorly lighted; yet, when one steps into the entrance of the building, the walls, which are painted white, look clean and bright, the halls throughout the building are well-lighted artificially, the floors and wainscoting in the hallways are kept as clean as possible, and every effort is made to give the tenant good service. The result is, every office is occupied, the tenants are satisfied, and the building developed according to the class of tenants. With some buildings there is more dirt than others. It is necessary to give more thought to the dusting because of the inability to get those offices clean.

Janitor Service in Western Buildings

By E. H. Sennott

WITHOUT attempting to introduce facts by a pictorially worded description of what constitutes good janitor service or dwelling on its importance, it may lead to intelligent discussion by giving some unit costs and by stating just how the work of janitoring buildings is economically and satisfactorily done.

Janitor service and supplies is the largest of the various expenses in the operation of a building, followed by elevator service, light, heat, repairs and improvements, etc.

Basing all costs on our experience in operating nearly eighteen acres of floor space, which includes three Class A eleven-story office buildings, one of which is a specialized building for physicians and dentists, one four-story mill type office building and eight brick store buildings, it may interest you to first know how large an operating force is necessary to care for the needs of twelve such buildings. The four office buildings have approximately 9,000 gross square feet to the floor.

This operating force, exclusive of general office help, numbers eighty-one, classified as follows:

- 2 Building superintendents.
- 20 Elevator operators and starters.
- 5 Day janitors.
- 2 Night foremen.
- 29 Night janitors.
- 2 Extra janitors.
- 3 Window washers.
- 2 Night watchmen.
- (Totaling 44 for janitor corps.)

- 3 Carpenters.
- 3 Painters.
- 3 Electricians.
- 2 Messengers.
- 1 Laborer.
- 3 Office attendants and telephone operators in Physicians' and Dentists' building.

Making a total of 81.

We will now refer to the forty-four members of the janitor corps. This service is performed by men. As to the merits of employing men or women for janitor service, it will not be considered in this paper. There are arguments in favor of both, the strongest of which are in favor of women, if we are to judge by the number employed by the majority of buildings throughout the country. We prefer men, however, for this kind of service, although at present we have one janitress on our pay roll.

The Post Intelligencer Building requires but one janitor; his services are required on but one of the four floors. The tenants on the other floors furnish their own service.

The White Building requires:

1 Day janitor.

1 Window washer.

1 Night foreman.

10 Night janitors.

The Henry Building requires:

1 Day janitor.

1 Window washer.

1 Night foreman.

9 Night janitors.

The foreman last mentioned we consider as an assistant foreman to the foreman in charge of the night janitors in the White Building, as we find it works to good advantage to perform the janitor service in these two buildings as a unit, in view of the fact that the corridors of these buildings are intercommunicating on most of the floors.

One extra janitor works throughout both buildings whose duties will be described later.

One watchman serves the two buildings. Both of these buildings are under one superintendent.

The Cobb Building, a specialized physicians' and dentists' building, under one superintendent, requires two day janitors, one night foreman, ten night janitors, one extra night janitor, one watchman and one window cleaner.

Summarized, the entire janitor force is:

Post Intelligencer Building	1
White Building	14
Henry Building	13
Cobb Building	16
Total	44

You will notice that the specialized building requires several more janitors than the other buildings. It is also a fact that there is less office floor area to the Cobb Building than in the White or Henry Buildings.

Further reference will be made to the cost of increase of janitor service in this particular building.

As the night force perform most of the work, starting at 6:00 p. m. and working until 3:00 a. m., one hour for lunch, eight hours constituting a working period, we will describe how this force is handled with reference to the White Building:

The ground floor and corridor, entire basement and toilets on these two floors are taken care of by one janitor. Service is rendered to only a few tenants on this floor. Floors throughout the buildings are maple, except corridors and toilets, which are terazza or tile.

The offices on the second and one-half of the third floor are taken care of by one janitor; not including the halls; and so up through the building, one and one-half floors are taken care of by each janitor. This amounts to 36 offices, and aggregates about 10,500 square feet.

The ten halls above the ground floor and the stairs are taken care of by one janitor.

The toilets on each floor throughout the building above the ground floor are taken care of by one janitor. This accounts for the ten janitors in the White Building.

The duties of the night foreman are to take care of the keys, give out supplies, change ribbon on clock and oversee all work done while he is on duty. His assistant, to whom we referred as night foreman of the Henry Building janitor service, runs a vacuum machine when same is in use, takes care of garbage, breaks in new men and helps oversee the work, etc.

The offices throughout the White and Henry Buildings are swept and dusted each night, and cleaned by vacuum cleaner twice a week; they are also scrubbed twice a week.

The windows throughout the buildings are cleaned on an average of once every two weeks. A man is able to clean about 50 of these per day; size of sash is about 42x38 inches. When the window washer completes cleaning the windows in any office he has tenant sign a slip if work is satisfactory and this slip is turned in to the building superintendent's office. In cleaning the outside of windows, the window washer uses a life belt. We require him to wear rubber soled shoes to prevent marking up varnished woodwork. When the weather does not permit him to clean windows, his duty is to wash light shades and interior glass throughout the offices in the building; also cleaning court skylights.

The toilet man's duty is to wash all fixtures in toilets, polish brass cuspidors in same and in the halls, numbering about 45 or 50, and to scrub floors. He is able to cover in one night about 1,500 square feet tile floor space.

The corridor man sweeps the ten flights of stairways and the ten corridors and scrubs one-half of the corridors in each building each night. He also washes baseboards in the corridors. The area of the ten halls is about 12,500 square feet and are all terazza floors.

Each janitor who covers, as previously mentioned, one and one-half floors, or 36 offices, also cleans and polishes the cuspidors in the rooms, empties waste baskets and dusts rooms, also dusting the corridors on the floors that he cleans.

The extra night janitor spoken of in the first part of the paper, and whose work was divided among the two buildings, takes care of waxing the floors and assisting in moving desks and tables, scrubs floors of elevator cars and other miscellaneous jobs, these being laid out by the night foreman.

The day janitor dusts stairs, toilets, puts paper in toilets, sweeps entrance to building and corridors, washes interior glass, light shades and fixtures; stairs, woodwork in the halls and toilets, wainscoting in the toilets, marble in the entrance and waxes floors, bales paper, polishes brass, dusts elevator shafts, etc.

The floors in the White and Henry Buildings are being gradually changed from oiled and filler surface to a waxed surface, and are now waxed to the extent of about 25 percent. The Cobb Building floors are being changed from varnish surface to wax, and are waxed to the extent of 90 percent. We believe that this service is more economical considering the satisfaction it gives, and the ease with which the floors are cleaned, although the up-keep cost of waxing the floors is more costly than varnishing. The greatest advantage is that floors look better and are better preserved in that they are not eaten into or rotted by powders. The floors are first shellaced and then waxed. It is necessary to wax the different offices anywhere from two weeks to two or three months, depending upon the wear.

The following figures are based on rentable space:

It costs the company thirteen cents per square foot per annum for janitor service for the White and Henry Buildings, and sixteen cents per square foot per annum for specialized building, or twenty to twenty-five percent more. Taking as a basis 225 offices in each building and averaging 310 square feet to an office in the White and Henry Buildings, the cost per year is about \$40.00. Averaging 200 square feet to each office in the Cobb Building, the cost for janitor service is about \$48.00 per office per annum. These costs include vacuum cleaning, all janitor service and janitor supplies.

The White and Henry Buildings are patrolled by one night watchman and the Cobb Building by one night watchman, whose duties are to see that all doors and windows are locked; that the lights are turned out, and each makes a record of all doors left open and the offices where lights remain on. Each watchman registers five times per hour during patrol and is required to cover his building or buildings according to schedule.

In the Cobb Building the janitors follow practically the same system, but are unable to clean as much space as in the White or Henry Buildings, which is due to the fact that the service is more exacting, due to the nature of the tenants. Each janitor covers about 7,500 square feet of office space per night. The vacuum service in this building is one and a half more frequent than in other buildings.

It is necessary to have an extra day janitor in this building for the enlarged duties. For instance, there are thirty operating rooms, tile and terazza floors, which require special service throughout the day. As previously stated, janitor service is the costliest and highest individual service in the operation of a building and the proper supervision of same is highly important, inasmuch as deficiency in this service soon brings complaints and dissatisfaction among tenants.

We have been particularly fortunate in the small number of complaints in service from the beginning in the matter of honesty among our janitors. It might be of interest to state that only two instances have arisen in two years where there has been any question as to the honesty of our men. One was in the case of the loss of a pair of suspenders and the second a feather duster. We could also recite numerous instances where valuable articles have been returned to our office and restored to the owners.

All the men on our payroll are given a week's vacation each year, provided they have been in the service of the company for one year.

We pay our janitors \$50.00 per month to start; if at the end of three months they are satisfactory, we increase them \$5.00, and at the end of the year another \$5.00, which is the maximum wage. Our night foreman we pay \$80.00 per month; assistant foreman, \$60.

Wages paid for janitor service and elevator operators' service is higher in Seattle than in most of the Eastern cities. The same service costs from \$25.00 to \$50.00 per janitor, often working longer hours for half what we pay in many instances. However, where women are employed, it is generally conceded that a man is able to cover the area that a woman would take one and a quarter times as long to do, thus partly offsetting the cheaper wage paid.



The Employment Department

By Emil G. Cheuvreux

THE best results are only obtainable where the employes have been carefully selected and are properly managed. Frequently you hear a building owner say: "Why is it we have so much trouble in our building, the elevators seem to get out of order so often, the repair bills on machinery are excessive and every other day some of our help leaves us. That building on the corner, which is the same size as ours, is kept in tidy condition, and the manager informed me that he has had no trouble of any kind and that his repair bills have been almost nothing." The manager in that building on the corner has used care in selecting his employes—men that know their business. He does not pick out his help at random and have his machinery experimented with.

Indirectly the help has an effect on the renting of the building, because if poor service is rendered a hard time will be experienced in keeping tenants.

Where the employing of engine-room forces, etc., for several buildings is under the control of one head it is advisable to have some sort of a sys-

Name	Date	19
Address	Age	
Married?	How many in the family?	Nationality
What license now held	Position	
How long have you had this license?		
Give nearest telephone number to your address		

TURN CARD OVER

Be very careful to fill out the following correctly, as far as you know how:

(1) State last three (3) places where you worked.
(2) State how long you were employed in each place.
(3) State reasons for leaving each job.
(4) Give NAMES and ADDRESSES of firms owning buildings.
(5) Give names of parties in charge and to whom you refer.
(6) State pay received at each job.

ON THE FRONT.

tem whereby names of good applicants for positions can be kept on file, together with references, etc. A good scheme would be to have cards printed, similar to the one shown in illustration, and every good applicant given one of these to fill out. If this method were put in operation in a short time it would be found that quite a few names have been collected.

I am about to outline a system that has been used to great advantage and satisfaction by an engineering concern, having under its control the operation of some thirty buildings in New York.

Cards, such as the one shown in illustration, are made up in different

Vacuum Cleaning

By Joseph Baker

VACUUM cleaning is the method of cleaning the interior of buildings and their furnishings by air suction, produced by a suitable machine and usually applied by a hand-operated nozzle implement or "renovator," as the latter is drawn over the fabric or surface to be cleaned, dislodges and carries off the dust and dirt, depositing it in a receiver forming part of the machine. The machine may be of either the stationary or portable type, the former being installed in the basement of the building, with permanent piping running to intakes throughout the building to which the "renovators" are attached by lengths of hose, and the latter being equipped with a single length of hose and wheeled bodily about the building. Different sizes and shapes of "renovators" are furnished, adapted to the different cleaning operations.

Vacuum cleaning is not new. It is settling down to a standard business, after passing through an experimental period. Properly conducted, either by the owners and the managers of buildings or by responsible companies, it is superior to the old cleaning methods that were in use before the vacuum system made its appearance.

The amount of dirt and dust that finds its way into a city building especially, as revealed by inspection of the receiving tank of a vacuum cleaning machine, is beyond what would have been thought possible. The dirt comes in mainly through the windows, and in the lower floors of an office building, for example, consists of street dust, of complex composition, while that found in the upper floors contains a large percentage of coal dust. Some of this "matter in the wrong place" settles down immediately and is removed by ordinary methods—dust-cloth and broom; but the vacuum cleaning system controls the dirt situation as a whole by taking care of the very fine dust which forms a good part of the incoming dirt, and that settles on the floor and walls and on and in the fabric of furnishings. That dust cannot be removed by brush or dust-cloth, but is simply stirred up into the air by them, where it remains in suspension for a long time before settling again. The presence of this fine powder in the air is unsanitary, to say the least; the vacuum cleaning system eliminates it.

In the apartment house, vacuum cleaning advertises the building, earns money for the owner, simplifies the work of the superintendent or janitor, keeps the hall and stair carpets clean and lengthens their service life and pleases the tenants. In clubs, hotels, etc., similar reasons for its use prevail. In office buildings, theaters, churches and other auditoriums it simplifies the formerly expensive cleaning in line with labor-saving machinery that is employed in modern, well-kept buildings. To building managers that have not used it it is a necessity.

From the viewpoint of the building manager, both the portable and the stationary systems of vacuum cleaning have their proper fields of usefulness. By a portable is meant a well-built, efficient machine and outfit, arranged to be wheeled about the building and brought up to the work, on

which it operates either directly through a slot in the bottom of the machine, or through short length of hose and nozzle. The good points of the portable may be described, having in mind an electric motor-driven outfit for attachment to the electric light wiring, and used extensively, both for installation in buildings and in contract cleaning by the concern that makes the machine. One form has a revolving brush which loosens the dirt as the machine is drawn over the carpet, removing not only the dust but such litter as match-ends, paper-clips and even cigar butts, which are then drawn up into the receiver by the suction. A cloth strainer retains the dust, allowing the air to pass on. Another cleaner operates through a short length of hose.

One advantage of the portable outfit is that each machine is a "unit" complete in itself. Thus, a single portable machine takes care of the twice-a-day cleaning of the floor coverings of a large auditorium, such as the Hippodrome, New York; the big machine being operated by a husky man, with or without a helper, after the dispersal of the audience. Whereas in a hotel of the same floor space to be covered, several machines are required, owing to the fact that, from the nature of things in the hotel business, the building cannot be cleaned as a whole at one time.

The first cost for a given cleaning capacity is in favor of the portable sets, on account of the simplicity of the outfit itself and for the reason that it is self-contained and requires no piping of the building, since the machine can be operated at any point by attachment to the nearest electric light outlet.

The portable machines can be used as a source of compressed air as well as of vacuum, by connecting the hose onto the pressure side of the pump, for blowing the dust from books, heating radiators, carved stone or woodwork, bas relief ceilings, etc.

Perhaps first among the advantages of the stationary outfit is the sanitary feature that it permanently removes the dust-laden air from the room, so that there is no chance for the release into the room of the fine particles drawn into the renovator. The air sucked in is carried to its receiver in the basement, which is emptied at intervals. In one type of stationary machines the emptying of the tank is done away with, the dust being taken up by a stream of water and discharged directly into the sewer.

Stationary vacuum cleaning outfits are installed to special advantage in large office buildings under construction, where the cost of running the permanent piping and the higher first cost of the machines does not weigh against the better organization and economy in labor given by a centralized plant and where there is a skilled engineer on the premises. A portable outfit large enough to do the same work would require special electric wiring, the cost of running which would probably figure out as high as that of running the piping. The absence of noise of operation in the stationary type is an advantage, especially in hotels and apartment houses.

In selecting a vacuum cleaning outfit of the stationary type, it is often the case that the capacity of the machine is given only nominally by the rated number of outlets. Thus, a thirteen-outlet set may be capable of operating only half that number of outlets at a time with good efficiency. Practical conditions also make the number of outlets that are actually in use differ from the rated capacity. Thus, under some conditions, the owner may find it advisable to put only a couple of men on the job, using one or two renovators at a time. At another time he may take advantage of a

Sunday or holiday to put a gang of men on and use a large proportion of the outlets. With any type of machine, the design of the pump should be such that the intensity of pull at the nozzle is constant, within practical limits, with variation in size of nozzle opening. Too powerful a pull or suction takes the nap off, especially from a dyed carpet, the fiber of which is weakened or rotted by the dying process. A demonstration should be made on the job.

A good "vacuum engineering" performance for a stationary outfit, operated by a two horsepower motor, would be a ten-inch vacuum (equal to five pounds of pressure per square inch) through a slot 12 inches by 9/32 inch (3½ square inches area of opening) at the end of a 100-foot length of 1-inch hose.

Careful distinction should be made between mechanical or dirt removing efficiency and genuine building management efficiency, which figures in the protection of valuable furnishings from mal-treatment. An unregulated suction on the nozzle implements is inadvisable. With too strong a suction the dirt is effectually removed, but the goods is drawn up into the slot as well, and so pinched, crushed and distorted as to shorten its life; while with a weak suction the dirt is not thoroughly dislodged. These failings account largely for the bad impression of vacuum cleaning in general that has been caused by some of the irresponsible "wagon companies" which have exploited the system. The patrons of some of these concerns have found, to their sorrow, that a powerful suction, operating through a narrow nozzle opening, has pulled the very life out of embroidered upholstery, fine rugs, carpets, hangings, etc.

With either the portable or stationary type of machine, the manager can put in one or more units, according to his immediate requirements and conditions, perhaps installing a single machine at first, and afterwards adding more machines, as they are needed, thereby keeping down his investment. This feature of flexibility of the unit system applies especially to the practice in our large cities of enlarging existing buildings, or tearing them down and putting up larger ones on the same site. The replacing of a six-story building by a twenty-story structure does not necessitate the throwing out of the existing vacuum cleaning outfit, but only the purchase of additional units to take care of the additional floor space. In machines employing rotary pumps, the maintenance is low—occasional lubrication, new carbon brushes for the motor, and a new length of the flexible hose once in a while are all that are needed, with reasonably careful handling.

The hose, which is wire-wrapped or otherwise armored to stand the pressure, will wear out in time—largely from dragging about over floors and around corners—and have to be replaced. The hose does not wear on the inside, although cases of cutting through of brass elbows in permanent piping by the abrasive action of the grit have occurred.

In the use of stationary plants there is a tendency to clogging of the long horizontal runs of piping by the deposit of a portion of the dirt which is not carried cleanly through by the current of air. This dirt is liable to be greasy and woolly and must be removed by a vigorous "blowing out" at intervals. Sometimes a flexible steel pipe auger inserted at convenient elbow joints is used to loosen the dirt.

The degree of humidity in the air has a marked effect on the operation of the system, the dirt being removed much more readily in dry weather, as might be expected. Most of the dirt collected by the machine is very fine,

and the strainers are provided to prevent clogging of the machinery by it. It is, however, inadvisable to have too many strainers in series, as the suction is thereby reduced. Bad clogging of the machine results from the use of too much or too heavy an oil for lubricating the moving parts. The machine itself should be cleaned out fairly often for best results.

The first use of vacuum cleaning is a striking demonstration of the amount of dirt contained in a carpet, for example, showing as a brightening of the color. After the cleaning, which removes the accumulation of years that had not been removed by ordinary methods, a cleaning with the vacuum once a month is often enough—or once a week under adverse conditions.

A variety of nozzle implements are usually furnished with the outfit, each of which has its special use. Thus, tools with plain slots of different lengths are best for general work, while brush tools are effective for cleaning burlap walls, carved or stamped surfaces, and some kinds of upholstery. In the Singer Building, New York, in which a large stationary plant is installed and in which there are more than 550 outlets, a separate coat and hat cleaning service is provided in the offices, comprising a small renovator which is operated by the tenant.

The point to consider in a vacuum cleaning outfit is a compact, well built machine at a moderate cost, that will give constant, positive suction; that may be started and stopped by simply turning on an electric switch; that may be located in the basement and installed in finished buildings without excessive labor cost, if of the stationary type, or that may be trundled about with minimum labor if of the portable type, and that requires a low minimum of attention and operating expense to keep it in working condition; and lastly, that not only removes the dirt, but effectually disposes of it.



Keeping a Big Factory Clean

By E. S. Park

ORDINARILY the care of a factory building offers little of interest except to those engaged in the same or a similar line of work. Some of the larger industrial institutions, however, with their many departments and their diversity of operations not only present the maintenance and service problems of most small factories, but also those of the office building, apartment house, public building and hotel. There is probably no better example of such an institution than the factory of The National Cash Register Company at Dayton, Ohio.

While this plant is devoted exclusively to the manufacture of cash registers, the operations engaged in are many and varied and a wide diversity of conditions is presented. The factory proper includes machine shops, tool making departments, wood working plants, foundries, wood and metal finishing departments, assembling rooms and extensive auxiliary departments, including a large printing plant, a bindery, experimental and testing laboratories, large stock and supply rooms and a modern power plant.

In the ten-story office building, with its 265,000 square feet of floor area, are the company offices, drafting rooms, invention departments, a gymnasium and circulating library for employes, a post-office sub-station and a completely equipped photograph gallery. The top floor of the building is fitted up as a club, known as the Officers' Club, and here, each working day, 300 heads of departments and their assistants take lunch and visit during the noon hour. On another floor a complete hotel with 48 rooms, baths, barber shop and writing rooms is maintained for the company's salesmen when visiting the factory, and for those attending the N. C. R. training schools of salesmanship. The first floor of this building is devoted mainly to the reception of the more than 50,000 people from all parts of the world who visit the factory each year. Here are reception rooms, rest rooms for women, reading and writing rooms, toilet rooms, museum showing the evolution of the cash register business, and, what is probably the most striking feature of the building, a perfectly reproduced city arcade lined on both sides with small stores of different kinds and running the full length of the building. Each of these shops is fully equipped with furniture and fittings particularly adapted to the business and is stocked with merchandise. The display windows of these stores, dressed with seasonable goods by an expert window decorator, are a liberal education in window advertising to the many merchants among the visitors.

Adjoining this building and connected with it by a tunnel is a large convention hall, modern and complete in every respect. In this building several conventions of salesmen are held each year and twice a day a lecture on the company's history and methods, illustrated with kinemacolor motion pictures and stereopticon views, is given for the benefit of visitors.

In addition to the diversity of conditions presented, the policy of the company in keeping its buildings as clean and sanitary as it is possible to

make offices and workrooms, is another factor in making the service departments of this factory of unusual interest. The company was one of the first to realize that wholesome working conditions and bright, cheerful workrooms mean more efficient workmen, and there is probably no factory in the world that does more to safeguard the health of its employees and to make their environment pleasant. The thousands of dollars spent each month in providing pure air, good, light and clean and sanitary workrooms and in maintaining well-kept, attractive grounds is not considered an expense from which no returns are expected, but rather as an investment that pay dividends in greater efficiency and increased loyalty of the employes.

The maintenance departments are necessarily large and very complete, as the company does most of its own construction work and all of its own repairs. These departments include an engineering department, a force of 90 carpenters, painters, tanners and plasterers, a plumbing department with 22 employes, 14 electricians, a force of 40 millwrights and helpers and an outside construction department of 140 employes which, in addition to doing excavating, concrete work, paving, sewer work, landscape gardening, roofing and track laying, also cares for the grounds, gardens and athletic fields, operates the greenhouses, cleans the streets and walks and handles scrap and car load freight.

The service departments include a force of 84 janitors, a laundry with 18 employes and an output of 333,000 pieces a month; 14 employes in the Officers' Club, 11 watchmen, two men who regulate the heating and ventilating throughout the factory, 20 elevator operators of which 13 are in the factory buildings and 7 on the six passenger elevators in the office building, a water distilling plant with a capacity of 1,200 gallons per day, a refrigerating plant, a garage with 22 employes and an equipment of ten motor trucks and six passenger cars, and a stable force of 18 men. In addition, there are telephone and telegraph operators, an emergency hospital with a physician and trained nurses in attendance, a force of guides to show visitors through the factory, and a staff of messengers delivering factory mail throughout the plant every forty-five minutes.

The factory is located in a residence section of the city away from the dirt and smoke of the downtown district and the manufacturing section. Surrounding the buildings are extensive well-kept lawns, trees, flowers and masses of shrubbery, all with a cared-for look that is not only an indication of the conditions indoors, but a powerful influence in encouraging cleanliness and orderliness among the work people. A large part of the 5,900 employes live in the vicinity of the factory.

There are ten main factory buildings connected by tunnels and bridges. These buildings are very similar in construction and arrangement so that a description of one will give a good idea of all. The typical factory building is 540 feet long, 60 feet wide and five stories high with a well-lighted basement, half above grade. There are three combination passenger and freight elevators with stairways adjoining them in the rear, one in the middle of the building and one about 100 feet from each end. On the side of the building next to the elevators and stairways and just in the rear of them, are three wings in which the wash rooms, lavatories and bath rooms are located. This gives three wash rooms and lavatories on each floor and makes possible a compact and economical plumbing arrangement. The interior of all the factory buildings, together with all work benches, tables, stock bins and machinery, is painted a soft light green. All buildings are

constructed with the largest possible window openings, four-fifths of all wall space being glass. The basement floors are concrete and all upper floors are maple.

In addition to the ten main factory buildings there are warehouses, a large power house, a building in which lumber is dried and seasoned, an oil house, a manufacturing laboratory, a garage and stables, a club house for boys and employes' educational classes, and a building in which employes keep bicycles during the day, besides the office building and convention hall already mentioned, making, in all, a total floor area of over 37 acres.

In order to form an idea of the conditions under which the janitor work is done, several unusual conditions must be understood. Practically all janitor work is done during the day, it being the policy of the company, in all departments, to accomplish as much as possible during regular working hours and to rest or play just as strenuously after quitting time and on Sundays. Another unusual practice is that employes with good records in the janitor service are rewarded after a few months or a year by being transferred to better positions elsewhere in the factory. The personnel of the janitor service is affected by another peculiar condition. Most of the janitor force wait on the tables in the Officers' Club during the noon hour. It has been found that young, active men make the best waiters and they are therefore given the preference in filling vacancies. As a result, the force includes few of the older professional type of janitors.

The janitor force, or, as it is known, the General Service Department, is made up of the following, all men:

- 1 foreman.
- 8 assistant foremen.
- 1 clerk.
- 1 barber.
- 1 stockkeeper.
- 1 man distributing towels and linen.
- 9 window cleaners.
- 8 cuspidor cleaners.
- 6 lavatory men.
- 48 general duty janitors.

The regular working schedule of the General Service Department is from 6:30 a. m. to 5:15 p. m., with one hour off at noon, making a 9¾-hour day. The 50 members of the force who wait on the tables in the Officers' Club work during the noon hour and are also given their lunch. The offices and factory close at noon on Saturdays, but the General Service Department works until 4:30 p. m., making a 57¼-hour week.

The company furnishes working clothes to all employes in this department—white duck suits clean daily to those working in the office building, and khaki suits clean twice a week to those in the factory buildings. In addition, all employes of the department are shaved by the department barber, some daily and some every other day, and are given a hair-cut when needed. The 50 employes of the department who act as waiters in the Officers' Club are required to bathe daily just before noon and are furnished a complete outfit of clean white clothes. This necessitates their leaving their janitor work at 11:00 a. m., and, as they do not get away from the club until 2 p. m., they put in only about eight hours a day on janitor work proper instead of 9¾ hours. The other employes of the department are permitted to take a bath once a week on the company's time—in fact, that is a

privilege extended to all employes of the company, bath towels and soap being furnished without charge.

The rooms of the General Service Department on the fourth floor of the office building include locker rooms, dressing rooms, Barber shop, linen room, stock room, wash rooms, and bath rooms with 24 shower baths and dressing rooms. The department also has work rooms in the basements of the other buildings and lockers for tools and supplies are provided in different parts of the factory.

The work of the General Service Department is directed by the foreman and his eight assistants. One assistant foreman has charge of the window cleaning and another the cuspidors. The office building is in charge of an assistant foreman with 12 men under him, while the other buildings are looked after by the other five assistant foremen, each having from 7 to 10 men.

While the factory departments begin work at 6:30 a. m., the employes in the office building do not arrive until 8 o'clock. This gives an hour and a half in the morning in which to clean the building or rather six floors of the building, as the occupancy of the other four floors permits their being cleaned during the day. In order to get this work done in the short time available the regular force in this building is increased by bringing in the window cleaning gang and three assistant foremen and their men from the factory buildings. Between 6:30 and 8:00 a. m. these forty men sweep the six floors, including the corridors, dust the furniture, empty the waste paper baskets and put everything in order. After eight o'clock the regular force in the building cleans the other four floors, scrubs the marble stairs and the main entrance steps, cleans the twenty-six wash rooms and lavatories, distributes towels, fills the drinking water stands with ice and distilled water, distributes paper drinking cups and empties the receptacles holding used cups, mops the elevators and does any special cleaning that may be necessary. The first floor, which is covered with linoleum, is mopped twice each day, once during the day and again in the evening after quitting time. This building is equipped with vacuum cleaning machines installed in the basement with service outlets on each floor. They are not used in the early morning cleaning, but on Saturday afternoons two floors are thoroughly swept and cleaned by vacuum, and during the week it is used for special work.

In one of the factory buildings—the women's building—work does not start until 7:15 a. m., and this building is also cleaned before the employes arrive. The four men regularly on duty in this building are helped in this work by two assistant foremen and their men from other factory buildings, making a force of 28 men who sweep three floors of this building by 7:15. The other two floors are swept during the day.

In the other factory buildings the janitor work starts as soon as the work in the office building and the women's building is finished. Each building is in charge of one of the five assistant foremen, some of whom look after three buildings. In most cases a janitor is assigned to each floor, although in several instances where the work is light one man looks after two floors. These floor men sweep their floors three times a week and in some of the departments daily, including the floors of adjoining bridges and the stairways. They also clean the wash rooms on their floors, wash woodwork, keep the drinking fountains clean, distribute towels and empty the rag and trash cans. There are 274 shower baths in the factory, some on

every floor, and each floor man cleans those on his floor and keeps them ready for use.

Throughout the factory buildings galvanized iron cans are provided, some for trash and some for oily rags and waste. Late every afternoon each floor man empties the trash cans on his floor into large boxes on hand trucks. These boxes are hauled to a centrally located platform and then on motor trucks to the company's dump about half a mile from the plant where their contents are burned by the man in charge of the dump. The contents of the oil cans are taken to a basement room and submerged in tanks of water until the next morning, when the rags are taken to the laundry and washed. After all factory work stops in the evening, five of the General Service men make a trip through the factory buildings and examine all rag cans to make sure that no oily rags are left in the building over night.

Each assistant foreman in charge of factory building has one lavatory man under him who cleans and disinfects the lavatories and distributes toilet paper. These men do not help with the early morning cleaning in the office building and women's building, but begin their regular duties at 6:30 a. m., and between them they clean all of the 120 lavatories three times a week and disinfect them twice a day.

The window cleaning force of nine men with an assistant foreman in charge, helps with the early morning work in the office building and works on windows the rest of the day. Two window cleaners work in the office building continuously and clean the windows and the glass partitions on eighth floors of this building every four weeks. The windows and partitions on the other two floors are cleaned every week on Saturday afternoons, all nine of the force helping with this work. The seven men working in the factory buildings clean the windows and glass partitions in these buildings every five weeks. All of the window men are provided with safety belts that snap into eye-bolts anchored on each side of the window frames.

The eight cuspidor men clean and disinfect all of the 3,800 cuspidors in the factory building three times a week and the 400 cuspidors in the office building daily. All cuspidors are cleaned in a centrally located room specially equipped for the work. Four men pulling hand trucks go through the building, taking up dirty cuspidors and putting clean ones in their places. The other four men clean the cuspidors as they are brought to the work room.

The kitchen of the Officers' Club is scrubbed daily with an electric scrubbing machine. This machine is also used on other floors that are free from obstructions, but most of the floor washing is done by mopping. The first floor of the office building is mopped twice a day and other floors are mopped after quitting time in the evening, the men in this building working two to three hours overtime once a week on this work. The floors in the factory buildings are mopped on Saturday afternoons and on Wednesday nights. Fifty-four men, in three gangs, each in charge of an assistant foreman, mop three floors every Saturday afternoon and three other floors every Wednesday night, working overtime three to four hours.

The General Service Department prepares its own soap for all kinds of cleaning. Pure soap chips and a small amount of soda ash are dissolved in water in 300 gallon tanks and the mixture cooked by forcing steam into the tanks. This makes a thick soap jelly that dissolves perfectly in water and does not leave a coating of soap on washed surfaces.

The sweeping compound used in all sweeping is also made by the de-

partment. With the exception of the vacuum sweeping done in the office building on Saturday afternoons, all sweeping is done with hair floor brooms, 18-inch brooms being used except on a few floors that are fairly free from obstructions where 24-inch brooms are used. Each floor man has a large trash box on a hand truck with him when he sweeps, and as fast as the dirt is swept into piles, it is shoveled into the trash box, which is later hauled to the central platform and then by motor trucks to the dump.

Every year, usually during the first part of August, the factory is closed down for two weeks and the employes given a vacation. During these two weeks the General Service force is doubled and the entire plant is given a good "house-cleaning." Ceilings, walls, partitions and floors are scrubbed; wash rooms, lavatories and bath rooms are given a thorough cleaning; lockers throughout the factory are fumigated and a large part of the interior of the building is painted.

The factory departments engaged in operations producing dust and dirt, such as the woodworking departments and the metal polishing rooms, are equipped with dust collecting systems. All machines in such rooms are provided with dust hoods connected by pipes with powerful exhaust fans which suck the dust and particles of metal away from the machines and carry them to the roof, where "cyclone" separators collect the dust and drop it through pipes to bins on the first floor. The dust collecting systems are a great help in keeping these departments clean, as well as a protection to the workmen.

This policy of protecting the workmen and safeguarding their health is shown in many ways. The factory buildings are all equipped with sanitary (bubbling) drinking fountains, while distilled water for drinking purposes and paper drinking cups are furnished in all parts of the office building. There are no roller towels in the wash rooms, small individual hand towels being used instead. Hair brushes and combs, which the company furnishes in wash rooms, are all collected daily, and thoroughly washed and sterilized. The coat rooms in different parts of the plant and the rooms of the General Service Department are fumigated regularly.

The General Service Department has many other duties that have not been mentioned. It exists to serve those who make and market cash registers, to give them clean workrooms and wholesome surroundings, and such service, well performed, includes a multitude of minor duties, as every janitor knows.



PART VI



Repairs

Economy of a Local Repair Department

By John A. Fedeler

REPAIR work is, to my mind, the most important item in the maintaining of property, and we ought to learn all we can about it. Many building managers are doing their own repair work now, but they have never taken the trouble to find out how large their saving is. Others have inherited a system of management which makes the extra duties of a local repair department impossible. Again, there are superintendents who do not care to assume extra duties because the contractors engaged in doing their repair work have a way of remembering their customers which is too profitable to lose. It is my opinion that a local repair department is inefficient if the men employed in such department cannot be kept busy seventy-five percent of their working time, and a building manager must know whether he can lay the work out for as many men as required.

The larger and the older a building is, the more the saving of a local repair force and by a fair comparison I have estimated that the duties of a superintendent running his own repair department are at least 50 percent as many as one who entrusts all his repairs to a contractor.

A large building is like a human being, the first years of its existence it is broken in to perform its function at a great expense. Then comes a period of efficiency and usefulness, and finally its period of decline. Only thirty years ago steel construction, elevators, gas and electric lighting were still in the experimental stage as applied to large office buildings. We have therefore a very few large buildings which can claim the honors of old age and which contain all the modern conveniences. There is no set of standard rules that can be applied for every kind of trouble which may develop in a building. Every manager and superintendent has to apply his own remedy.

If your property has no leaky water, gas or sewer pipes you may rejoice, but remember, nothing is everlasting, and it is only a question which one will last the longest, you or the building; meanwhile, watch your plumber and steamfitter, so that they do all their work properly, and allow you to inspect all their work under floors or inside of partitions before the work is covered up. The best of mechanics will become careless if they find that their boss does not take sufficient interest in their work. I have seen as many as twenty plumbers and pipe fitters repair jobs, which have cost the building from \$25 up for each case on account of criminal carelessness in repairs. You send a plumber, for instance, to clean a pipe which is stopped up. He first tries to blow the obstruction out with his pump. Then he may try some lye or acid. He may also try a vise snake, and if not successful he will come to you for permission to open up the floor or wall; if he now is certain that you are not likely to inspect his work he will cut a slit in your lead sewer pipe or drill a hole in the iron pipe, then use his snakes until the pipe is clear. By this time it may be late in the afternoon, and instead of soldering upon your lead pipe or putting a plug in your iron pipe, he will use ordinary elect tape, tape the pipes up, cover up the floor

and that may be the last you hear of it for years, then the tape gets bad and another obstruction in the pipe below the cut allows the water and sewerage to flow out between the floors or inside of partition, which in time may ruin the ceiling for several floors below, particularly if the leak is near a column.

This is a sample of your local repair department, if you trust your own plumber too much. Now, let me counteract this with an experience as an employe of a contractor. This happened in 1892; users of electric motors did not know as much about their machines as they do now, nevertheless I know similar practices are still in vogue.

I had just been employed as an electrical expert by a repair company. The boss came up into the shop, an armature winding room, and instructed me to go to a certain printing company, disconnect a large motor and get it ready to load up on a wagon, other help would follow. When I reached the printing office I found a very excited manager. It seemed to him a very great calamity to be unable to get power, all hands idle and so much work for the presses. I asked him how the motor stopped, and he said it just slowed down to nothing, which is unusual, when a machine is damaged very bad. He could not understand it, and as no one had given the motor an inspection, so as to determine what was wrong, I tested the machine out myself and found, to my great surprise, nothing wrong, but a loose connection at the rheostat. I soldered this, started the motor up, and told the manager everything was O. K. He certainly was grateful; he gave me \$5 as a tip and I went on my way back rejoicing to break the good news to my own boss. As I entered our office he said, "Hello, why didn't you stay to see that the motor was loaded properly on the wagon?" I told him the motor was O. K., and that I fixed a loose connection on the rheostat.

He actually scared me, for I thought he had gone crazy, and I can only repeat the following distinctly:

"So, you call yourself an expert? Well, if that is the kind of work you do, I don't want you. How do you suppose I am going to pay my shop expenses? Why, I have a ten-year-old boy that can do better than that; go and get your money." The question therefore is, are you paying for the work of the repairs or are you paying some one's shop expenses?

When your building is getting old, and your repair expenses are increasing, you will hear from the owners or stockholders. Many, I know, will express themselves like this:

"My dear man, this building has run for ten years, and we never had to pay so much for repairs," or, "If that machine or boiler is worn out, it was never taken care of properly; it ought to have lasted longer. You will then, as we now term it, be up against it good and hard. You will there earn your bread with the sweat of your brow. You must see that the dividend is not diminished, and that is the time when all kinds of economy in repair work will interest you most.

Many a good man has found himself in such a position, but encumbered by a wasteful system of management, he has had to make place for someone else, more experienced to handle just such a situation.

The above came to pass at the New York Produce Exchange Building. The old management was replaced by a new one, and the property placed in the hands of the present agents, Douglas Robinson, Charles S. Brown Company. First, the rents were readjusted, and incompetent employes discharged and replaced; then a local repair department was added. Men

who were overpaid had their salaries reduced; the majority, however, had it raised to conform with the wages in other buildings.

The most important matter, to my mind, which will reduce the cost of repair and operation in a large building is the system under which it is managed. I want to propose to you a system I operated with, how you may do your own repairs, and still have time to spare.

There should be two separate offices in a large building, the renting of offices, the making of leases, investigation of new tenants; collecting of rents and paying of bills should be attended to in one office, for which only the agent, owner or manager is responsible.

The superintendent should have a separate office, and be held responsible for the janitor's department and the maintenance and repairs of the building. The superintendent is the man who is best able to judge of the requirements of his tenants; he is closest to them, in the best rented building the manager or superintendent generally made it so.

The idea of separate departments is also economy. If you have a number of small tenants, there is always a large number who do not like to part with their rent. It seems to hurt them to pay up, and when they do so, they invariably have a complaint to make of some sort. If they are then referred to some other office to lodge their complaint, they will forget it unless such complaint is justified.

The superintendent should select his assistants. Every man or woman under him has his or her duties to perform. Complaints with reference to the cleaning of offices are sent to the superintendent, who investigates and lays the blame where it belongs. The superintendent orders his material through the building manager.

Here again our method of accounting is very simple. An order is made out on the agent or dealer. A copy of this order remains in the order book. After the goods have been received and the bill presented, the amount and cost of the material is written on the original copy, and the date the bill has been approved for payment. This copy is then torn out of the copy book and filed, so that each of the various items or material are kept together, and an easy access can be had to any previous order. This is very handy when you wish to find out how much you paid for, where you got it before, and how much is used for any given period of any material.

Once every year I make an inventory. (See Exhibit "A.") Each line contains the name of a material we carry in stock, and by purchasing a monthly supply, I am able to check up with the previous year whether there has been any waste. This list does not include any material used for repairs.

The engine room is in charge of a chief engineer; as the changes in this department are not frequent, I generally investigate a prospective employe and then send him to the chief for approval or rejection. My relation to the engineer force is that of a consulting engineer. All repairs and purchases are ordered through my office. A superintendent can best serve his object if he carries an engineer's license; it is, however, not essential. The consumption of coal and oil per day and month is kept on file the same as before mentioned.

Every hour the steam pressure, the load in amperes, and the number of the engines running is marked down. If you want to adopt a log which will tell you at a glance the condition of your engine room, the following

INVENTORY, APRIL 30, 1909.

800 lbs. soap powder @ .02%.....	\$18.00	100 lbs. waste @ .08½.....	\$ 8.50
30 cakes sapollo @ .04%.....	1.20	½ box toilet paper @ \$8.50.....	4.25
72 cakes of soap @ .04 1-6.....	3.00	4 lbs. sponges @ \$2.25.....	9.00
3 doz. cans lye @ \$4.80.....	3.60	½ doz. squeezers @ \$13.50.....	6.75
100 lbs. oxalic acid @ .07½.....	7.50	2 doz. pails @ \$8.00.....	16.00
15 lbs. marble polish @ .02%.....	.40	6 dust pans @ \$3.50.....	1.75
200 lbs. klensall @ .04.....	8.00	½ doz. wringers @ \$8.00.....	4.00
7 gals. polish @ .60.....	4.90	2 cans pipe klenzo @ .45.....	.90
1½ doz. com. brooms @ \$2.50.....	5.25	16 bags sawdust @ .15.....	2.25
65 scrub brushes @ \$3.50.....	6.50	10 paper bags @ .25.....	2.50
6 radiator brushes @ .50.....	3.00	4 gals. hypozone @ \$1.00.....	4.00
6 hand brushes @ .50.....	3.00	20 gals engine oil @ .20.....	4.00
6 dusters @ \$11.50.....	5.25	20 gals cylinder oil @ .40.....	8.00
30 lbs. scrub cloth @ .16.....	4.80	1 gal. crude oil @ .30.....	.30
40 lbs. cheese cloth @ .30.....	12.00	2 gals. alcohol @ .60.....	1.20
6 mops @ \$4.00.....	2.00		
1 doz. mop handles @ \$2.00.....	2.00		
			<u>\$164.80</u>

RECAPITULATION.

Janitors' supplies	\$152.80
Engineers' supplies	12.00
Painters' supplies	
<u>Total</u>	<u>\$164.80</u>
40 W. 100 Tantalum lamps	\$ 35.00
25 W. 100 Tantalum lamps	35.00
<u>Total</u>	<u>\$ 70.00</u>
Coal, 50 tons	\$157.50

EXHIBIT "A."

description will serve you. If you want to have a simple log, here is something that I have examined and found very efficient. For instance, I have a big book. I have a piece of canvas on that so that when the engineer puts his hands upon it he won't soil it. One page is used for the day run, and the other page for the night run. The pages are arranged as shown by Exhibit "B."

This form represents the day run. The two pages facing each other will do for one month. You see under every hour I have got three small separate columns, which gives me the amperes, number of engines running, and the pressure of steam. This table will show you at once when your coal bills are getting larger.

It is easy to note how you may compare one day with the other, and in practice you can see by the variation in the electric load how the days are gradually getting shorter or how a larger consumption of coal during any period is accounted for by dark weather, etc.

The repair department is under my personal direction. Where in a small building one man can attend to many different classes of repairs, in our building we have a first-class carpenter and cabinet maker, who can also make keys and repair door checks. An electrician to attend to electrician's repairs and constructions.

A plumber who also does all kinds of pipe fitting.

A plasterer who can lay tile and brick and build plaster block partition.

An elevator machinist to do all elevator work.

A helper who can mix mortar, trim an arc lamp or paint, and from four to ten painters, as may be required at the time.

All these may be used in an emergency for roping an elevator or in case of fires, etc.

All complaints are sent to the superintendent's office where an order for the work is made out and the duplicate filed.

These slips are a great help to a superintendent in laying out the work for his men.

The copies are classified and counted so one is able to judge whether the work is increasing or diminishing, whether one gets enough work for the salary expended, etc.

If I have a good man I always make it my business to do the best I can for him, and when he has reached the limit of pay I feel I can afford for this position, I frankly tell him that I will help him into a better job, when an opportunity presents itself. Having done this a number of times successfully, the rest feel their turn will come to get a better position, and they all try hard to please. I think superintendents ought to take more interest in deserving young fellows who want to become engineers

June.	7 a.m.	8	9	10	11	12	1	2	3	4	5	6	REMARKS.
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EXHIBIT "B"

and superintendents; I make it a practice to always have one such in training and breaking him in. It is very gratifying to see some of these men get along after they leave you. The best advice to give to a man who wants to superintend his own repairs is, spend some of your idle time in making imaginary emergency repairs. Train yourself to be ready for anything which can possibly happen to the property in your charge.

Psychology teaches us that it takes time to plan and as there is not always time to plan when human life is at stake, be ready to give the right orders while others suggest and have the hysterics. The practice to

plan emergency repairs helps you to prevent accidents, because you are always looking for the weak spots, which are immediately repaired when found. It has helped me so often that I must relate to you an experience.

The elevator system of the New York Produce Exchange includes four pressure tanks and fourteen elevators in three separate buildings; two of these tanks are located on the roof of the Exchange Building; from these tanks radiates one pipe to each elevator. These pipes are fastened to the tanks by means of a flange union. On my inspection trips I would say, "These pipes should have their valves closer to the tanks. If one of the pipes should break between the tank and the valve, which is six floors below, all the water in the tank will pour down the elevator shaft. The only thing to do then would be to shut the water off on the feed line from the pump, wait until the tank is empty and make a temporary repair by putting a blank flange on the tank in place of the pipe broken."

Many of you would, no doubt, have considered such thought unnecessary. Had not these pipes been in service 25 years and was not there the safety valve to prevent an excessive pressure?

This is all very well, but when the equipment in a building is getting old, the unexpected generally happens. One day one of our elevators was reversed too suddenly and the strain broke one of the aforesaid pipes above the valve and we certainly had a miniature Niagara in our elevator shaft. In three minutes I had the supply shut off in the engine room, and in ten minutes the ten elevators connected to the other tanks were in operation again. In an hour after the accident all repairs had been made, so that only the elevator affected was out of commission for a day. If a dynamite bomb had exploded the excitement could not have been worse for a time. Orders for the police department, ambulance, boats, etc., were given promiscuously by everyone. People went into hysterics, and I am certain had I not been prepared, I would have made a poor showing and instead of congratulations, I might have been looking for another position.

The efficiency and economy of a repair department depends to a great extent upon local labor conditions. If a contractor can hire labor as cheap as you, you will hardly be able to compete with him on contract work. The cost does, however, not always play the most important role for the convenience is so great in a well organized local repair department that other matters are not considered. They can be called upon in case of fire and flood or other emergencies.

In my case the matter of cost was of greatest importance, and whenever the labor conditions are similar to those in New York, I believe the work of carpentry, plaster block partition building, painting, tile repairing, plumbing, etc., can all be done cheaper and better by a local repair force.

In New York there are always men with families, who prefer a good, steady position, with less pay, than a job now and then, with union wages. Sometimes, of course, there are changes in a local repair department which will strain the patience of a manager.

The new man is found incompetent, dishonest or a drunkard, but you may have similar experience with the help of contractors.

New York is a very strong union town; contractors in estimating on work must estimate on paying union wages. Some of the unions close

their books as soon as a few of their own members are out of work, and the consequence is that many a man who would be a union man became disgusted by such an injustice, and there is, therefore, no lack of skilled labor at lower wages.

The average saving on the carpenters, stone masons and plasterers' work over that of contractors, is 25 percent.

On painter's work, about 20 percent.

On plumber's and pipefitter's work, from 50 to 100 percent.

On elevator work, from 100 to 1,000 percent.

On electric work, 100 percent and more.

By a fair comparison, I have found that the saving of 4 percent of the gross income can be affected by employing a local repair force.



PART VII

Buying Supplies, Etc.

Purchasing Supplies for an Office Building

By J. M. Walshe

WHEN the first proposal to manage an office building was made to me, I was in the electric contracting business in Texarkana, and though the proposition came from a friend, who I am sure now, had only my interests at heart, I hesitated and debated the question in my mind for some time, trying to see that it wasn't a joke (I had never heard of a building manager), and that such a position was not less dignified than the one I thought I was entitled to. After some close consultation with other friends, I decided to accept the "job." I was bundled off to St. Louis to look over the buildings there, and to gather as many ideas as possible on the systematization, operation and maintenance of an office building. It was there I met a very reserved manager, who immediately, through his bearing and manner relieved me of any sense of a building manager being a joke. By a little diplomacy, and showing that I was really interested in the matter, this quiet man, Mr. Guy Wright of the Wright Building, St. Louis, and his able corps of assistants opened up their wells of information, and in a week I had absorbed more knowledge concerning the management and maintenance of an office building than I ever knew existed. Needless to say, I went back to Texarkana with an entirely different feeling toward the position of building manager than when I left.

My first task was the systematization of the operation end of the building, and in about a month I had been able to establish a very good order of things, which proved efficient.

Passing over this initial period to the time when I had an opportunity to take up the purchasing of the supplies used in the building, I will try to tell you what I found and how it was remedied; but before going into the details of this matter, I will ask you to bear in mind that one of the things we have to contend with in the southwest that is most discouraging, is the high rate of freight we have to pay, and you will note all through my paper that the prices are based on this freight rate, which has been taken into consideration, and undoubtedly you live near manufacturing centers, and in the east, will be able to get much better results in the price line than we have on this account.

On my daily rounds of inspection, I noticed a great quantity of toilet paper on the floors of the toilet rooms, which led me to investigate the cause. I found that these sheets were pulled off in bunches, either maliciously or abstractedly, or that the paper rack in one toilet would be empty, and the next man in would grab a handful of paper out of the other toilet, and leave what was left on the tank or throw it on the floor. To try to overcome this latter part of the loss, I had janitor leave an extra bundle of paper in each toilet for such an emergency, thinking that the tenants would be glad to put it in the rack when the other paper was out, but oh, my, how mistaken I was. The extra roll was either stolen, thrown in the closet, or the wrapper taken off and littered over the floor. I looked

hard for some system to overcome this, and sent for samples of several makes of racks, and after carefully looking into the merits and demerits of each and every one, I applied a test which gave them all equal advantages in showing their economy and efficiency. I selected a toilet room on a floor that was leased to a large railroad company. I put on one rack at a time, and kept a close record of each for thirty days, and I give you here the results of that test:

Name.	Rolls per mo.	Cost per roll.	Total.
No. 1	4½	6c	27c
No. 2	4	6c	24c
No. 3	1⅓	8¾c	11c

This gave us a clear saving of 13 cents per toilet per month, and we tried it several times in several places to prove it. In addition to this saving, we found a great many other advantages in this package. We installed this system throughout the building, and were exceedingly well pleased with the results. We tried many other papers, some that cost as low as three cents per roll, but we found from a basis of efficiency that the above papers were about the only ones worth considering of those that we tried.

In the matter of feather dusters, I have had many interesting remarks passed in communicating with managers throughout the country, and in one case especially, I asked the question, "Do you use feather dusters?" and got this reply, "Yes, damn 'um," which remark seemed to me quite appropriate.

We had been buying dusters of the one hundred feather sixteen-inch size in half dozen lots, at seventy-five cents each, and it seemed as though we were constantly buying dusters. I noticed two things—one that the handles were always gone, and the other that the dusters were thrown away when about half worn out. I put on a careful test on the dusters of different kinds and types, and finally selected a duster with 150 16-inch tail feathers, wire bound, with leather glove and a short stub handle, as giving the best results, and this gave us a saving of about sixty percent on our duster bill, and we were able to use all the old dusters on the grille work in the elevators.

In reply to the list of questions I sent to certain building managers throughout the country, reference to the supplies, I found that they were all using cheese cloth for cleaning rags, paying an average of three and one-half cents per yard by the bolt. I had tried cheese cloth but gave it up when I found that I could buy clean, white, sanitary rags in bales at six cents per pound, and that these rags saved me over fifty percent of my cheese cloth bill, and, in addition, to my great surprise, found that after their usefulness upstairs was over, if they were washed, they made excellent cleaning rags for the machinery in the basement; so we not only saved in cost of cheese cloth, but almost entirely eliminated the cost of waste in the engine room. We distributed the rags in one pound lots.

Next, I found that we had been buying our toilet soap from the barber shop in the building. This was the soap that was left over after a person took a bath, and as each bather was furnished a new one-ounce bar in its original package, there was considerable left, for which pieces we paid one cent a cake. After devoting a little time to this, I found that I could buy toilet soap of an excellent quality in two-ounce packages at \$3.00 per gross, and have the name of the building on each cake, also a special color that would not be sold to anyone else in town, so that we could distinguish

our soap wherever found. This fact soon became noised around town, and we found that our soap supply lasted from two to three times longer than previously. Our janitors have instructions to pick this soap up whenever found in the offices and replace it in the toilet rooms, as we supply soap in the toilet rooms only, and allow the Towel Supply Company to furnish it in the offices. I am doing much better than this now, however, but still retaining the color scheme. By making a contract with the Towel Supply Company, giving them exclusive rights in the building they furnish us twenty-five clean towels every day for use in our toilet rooms, and sell us the same soap at \$2.00 per gross, for which we had been paying \$3.00.

The mop question is a much debated proposition, and I am sure that every building manager will be interested in our solution of this problem. We were paying fifty cents to seventy cents each for cotton string mops with handles, and carried no stock on hand, from the fact that each janitor or janitress wanted a different weight and a different size according to their strength and ability to handle it. I had been told to buy mop yarn in bales. After some careful study and making many inquiries, I found I could buy mop yarn in balls at twelve and one-half cents per pound, and could make up any size or weight of mop that I needed, eliminating the necessity of carrying a large stock and many sizes. This required getting a mop stick that would hold the strands of the mop without their being sewed. This I found in a mop stick which fastened and held the mop yarn tightly without being sewed, and the stick outlasted many mops.

We had been using sweeping compound on the floors of the corridors, and in the banking room, and were paying from \$3.50 to \$6.00 per barrel for it. I was sure that somebody was buying standard oil stock with his profits from this gold brick, so I tried different methods of making this ourselves, and found that by taking some good, hardwood sawdust mixed with one-third clean river sand, sprinkled with a good grade of disinfectant and some coal oil, a mighty good sweeping compound was produced, and gave the desired results at a cost of about fifty cents per wagon load. I might add that I have since discarded the use of sweeping compound entirely; having found that it was really of not much practical use.

We used push brooms on the tile floors of the corridors, and paid \$2.75 each for a twenty-four-inch Russian bristle brush with a pretty red back and handle. I kept my eyes open on this for over a year, and talked with everyone I thought knew anything about brooms, or brushes, but to no avail, until I accidentally found one that entirely suited my every need, at \$12.00 per dozen, and also found that these same brooms were being supplied to all the large wholesalers, but it took me over a year to find it. I received a little post card once that particularly applies to this push broom proposition, and on the post card was printed in red letters, "I'll do anything once; if I like it, I'll do it again"—and this I thought was particularly applicable to the purchasing of supplies.

With reference to corn brooms, I must say that I have had little, if any, success in economy, except that I can now look at a broom and judge pretty well how good or bad it is. I find that a good, clean corn broom is about \$5.50 per dozen, with five strings or a metal cap will give me the best service I have been able to get.

In the matter of powdered soap, I have been experimenting carefully for nearly a year, and have tried many kinds and makes and am still searching for something better. The best results I have been able to ob-

tain have been with a cleaning compound for the tile and marble floors, which costs about four cents per pound. Where the tile and marble floors cover considerable area, and where the corridors are wide and long, I strongly recommend the use of a scrubbing machine, as being very economical and giving very good results. You need not, however, expect to put this machine into the hands of an inexperienced janitor to work out his own problems with it—it requires careful and systematic operation and instruction in handling it in order to get the desired results. It is queer how some things come up unexpectedly, and from what sources they originate. When I wrote the first copy of this paper, I made a note in it to this effect:

“Right here I want to ask some one who has found a real successful window cleaner to let me hear from him, as I have not been able to do so.”

This was about four weeks ago, and a few days later, a young man from the bank walked into my office and showed me a little package that he called a window cleaner, and asked if I ever tried it. I told him no, that it did not look good to me, but that I would be very glad to give it a trial. He said that a friend of his had bought two or three cases at a railroad wreck, and if I could use it, he would make me a very low price. I turned it over to the window washer, and am pleased to advise that his records show that he was able to wash, clean and polish most successfully, over 150 windows with this one package of “it,” at a cost of $3\frac{1}{2}$ cents per package, and I found that the windows were thoroughly cleaned and had a very fine polish. I also discovered that the reason he had to stop when this number of windows was washed was because the cloth wrapper or bag had worn out. He is now experimenting with another bag on the outside of the original package, and uses it this way. I am quite sure that this is going to solve the window cleaning problem, but, nevertheless, I would still like to hear from someone who has successfully met this problem.

Most buildings have to use considerable metal polish and it is very expensive, and very easily wasted. I think, perhaps, I am somewhat of a crank about having metal around the building clean and polished and kept that way—and for this reason, I have been more careful in trying to find a good polish that would keep bright for the longest period of time. I have tried everything that has been brought to my notice and found that I got very good results from using a certain metal polish. This polish gives a high lustre—is unburnable—does not evaporate, and does not contain ammonia or other acids that are unpleasant to use. It puts on a finish that lasts an unusually long time, and costs about 70 cents per gallon. I find also that if you will take a piece of cotton cloth soaked in castor oil, and rub it over the surface of the brass just after it is polished, then rub the brass off thoroughly with a dry rag, that a thin coat of oil will have formed over the brass, preserving it in this condition for a very long time.

Almost every building supplies towels in the toilet rooms. My experience has been that quite a number of these towels are missing from time to time, and at the end of a year, it makes quite a fair sized item. To overcome this stealing in my present building, I bought a special towel rack that locked the towels on the roller bar with a key, making it impossible for anyone to take a towel off the rack without a key, or without cutting it, which it is improbable they will do.

Next, I took up the engine room, and here I had to fight for every

concession. The engineer was an old-time steam man, and was absolutely sure that he knew all there was to be known in that end of the business, and would not allow any up-start to tell him or show him what he ought to do. He was not very much pleased with my being put in charge, and was, therefore, not inclined to assist me very much, but after studying the man and the conditions for awhile, I insisted on certain reforms and radical changes in the installation and general system of handling this department. We had two direct connected engines and generators and the erecting engineer who installed the plant had advised the engineer to keep a pretty good load on the engines all the time in order to make them do their work well. He seemed to give absolutely no consideration of the matter of efficiency, or of economy of operation. I, therefore, proceeded at once to find out just what point these engines would operate most economically. I cut the day load down to a point where we got the greatest efficiency out of our lighting plant during the day. Then I went into the boiler proposition. We were using natural gas under a pressure of eight ounces at 11 cents per thousand feet, and our records were showing very poor efficiency, so we experimented first with one boiler for a month, then the other, changing the burners, draft, and damper connections, baffle and fire walls, until we found that we could get the greatest efficiency at the least cost, and in this experiment found that we could get much better results from home-made burners than from any of the manufactured ones that we had seen or tried, and we cut our gas bill from \$355.00 per month to \$256.00. I made these tests by checking the reading of the wall meters, which I had put on each generator panel of the switchboard, and the water meter on the boiler feed line against the gas meter.

I noticed that we were using considerable cylinder oil in the engines—about two barrels per month, at 80 cents per gallon, using twenty-eight drops per minute in the larger engine and twenty-two drops per minute in the smaller engine. This seemed considerable to me, but the engineer insisted this was the least amount of oil on which he could run his engine safely. Not being satisfied, however, I wrote to the makers of the engines and asked their recommendation as to the kind of oil to use, and how to tell when the engines were receiving the right amount of oil. They took pleasure in telling me all I wanted to know on this point, and in trying to put their recommendation into practice, notwithstanding the economy that would possibly result and that no possible harm could come to the engines, if carefully watched. The engineer became very antagonistic and took the matter over my head to the president of the building company, telling him that he had been an engineer all his life, and knew more about engines in a minute than I did in a week, and that if I was allowed to proceed, I would surely ruin the engines, and cause the building company considerable annoyance and expense. I insisted, however, and after some threatening, tried the scheme out, and in a month we had cut the supply of oil to the large engine from twenty-eight drops per minute to six drops per minute, and on the small engine, from twenty-two drops to four drops per minute, and the engines were running with plenty of oil, and to the best of my knowledge are still running this way. Oil, to most men, is an unknown quantity, and its sale mostly depends on how good a fellow the salesman is, or whether he belongs to the same lodge. There is a simple

test that you may apply to the different oils you use to try their lubricating qualities.

Procure as many light watch crystals as you have samples, fill each of the crystals with a different oil, and place them in an even temperature, say 75 or 80 degrees Fahr. In the course of a few days, giving them an opportunity to absorb oxygen, test by taking an ordinary pin with a large head, dip the head end of the pin into the center of the oil, lifting it up slowly, you will then notice that there is a good deal of difference between them. Some will drop clean off the head of the pin, others will string out, connecting the pin to the surface of the oil; while others have become so thick that the pin head will attach itself to the heavy coating on the surface of the oil, so that the crystal and its contents can be almost lifted up and held in suspension.

Amongst the various samplers, try castor oil and ordinary kerosenes, you will notice that both of those named will free themselves from the pin head at once—the first named somewhat slowly, by reason of its natural viscosity, and the second quickly, by reason of its fluidity. The reason for this is that the castor oil and kerosene do not absorb oxygen freely, and therefore do not thicken. The castor oil will, in the course of time become rancid, but its lubricating qualities are not greatly injured by the rancidity. Kerosene, of course, has very little lubricating value, and the comparison is made simply to show the action of the atmosphere on them.

All the commercial lubricating oils that are offered today have a petroleum base, and their value is increased by the amount of animal or vegetable fat they contain. The animal fats are tallow, lard oil and fish oil. The vegetable oils are more numerous, such as olive, palm, cotton, corn, rape, etc., etc. All the above mentioned fats can be readily mixed with the mineral or petroleum oils, the mixing of which is an art in itself, and no general recipe can be given for combining them. As a rule, most of them are mixed together in a heated condition; if mixed cold, they will not hold in solution, owing to the differences in their specific gravity. The temperature varies in every case, and with each different fat. Castor will not mix with petroleum oils under any condition.

The oil that will not readily absorb oxygen is a good lubricant, and the oil that does so, is a poor one. The oil that absorbs oxygen freely, fires spontaneously, becomes a source of danger. Linseed oil, rape oil, olive oil, lard oil, tallow oil, will fire spontaneously, with a slight rise in temperature. Saturate pieces of cotton waste with each of those named, press all the oil out of the cotton waste until it is comparatively dry, place the different samples of saturated cotton waste directly under the sun's rays, and you will find that they will fire in about the order named, or place them in a temperature of about 90 degrees Fahr. and they will fire in from four to eight hours' time. The greatest danger comes from the piece of cotton waste lightly saturated with linseed oil, or as is frequently the case, a mixture of linseed oil and turpentine; hence the great danger following the average painter, who carelessly throws his cotton waste about without any thought of what may follow. (Hence, the reason why insurance companies insist on certain precautionary measures.)

A great many experiments have been made and a great deal of discussion has taken place over the relative value of solid and liquid lubricants, and as a general rule, wherever a liquid lubricant can be fed reg-

ularly, it is better than a solid lubricant, unless it be on a heavy, slow moving bearing, whose great weight practically squeezes all the lubricant out. hence we find that all heavy engine shafts are generally lubricated by solid lubricants, supplemented by an occasional drop of liquid.

Makers of solid lubricants claim greater economy over liquid lubricants, and while this may be perfectly true as far as the oil account is concerned, the economy is procured at the expense of the power and fuel account.

I think that every engine room, no matter how small, ought to be equipped with an oil filter, for any good grade of oil can be filtered and used over again, possibly once, and sometimes twice, and then the residue from the filter makes a very good lubricant for the elevator guide, if properly mixed with flake graphite.

In buying an oil filter, however, I would advise there is no economy in buying a cheap, imperfect one. I would strongly suggest purchasing the very best on the market, and one which has well made parts, and is made up on good mechanical lines.

We were purchasing our water from the water corporation, and after getting a reading on the water meters every day for a month, I tried several experiments with leaky faucets, and these all showed such a considerable waste that I found it expedient to have every leaky faucet in the building repaired at once, and arranged to keep them so. This reduced our water consumption from 10,000 to 6,000 gallons per day, which more than paid for the trouble. In my present building, they found during construction, a number of springs in the sub-basement which seemed apparently of good quality of water, and which it was contemplated pumping into the sewer. After some careful study it was decided to save this water for use throughout the building.

This was done in a very simple and easy manner, and after having two chemical analyses made, we are using it now in the building for every purpose except drinking water, and have all we need, throwing away over 300 gallons per hour besides. This saves us over a hundred dollars per month water bill, and costs only the amount of power required to pump the water to the roof, which is very small as we would have had to pump the water part of the distance anyway.

The coal question is one to which I have given considerable thought, possibly because I had an option on 4,000 acres of liguite coal in Texas, which I thought would some day make me a little extra pin money, but my balloon bursted, because the coal slacked so quick that it could not be shipped. In our country where it is considered that we have the best steam coal in the world, we are unable as yet to purchase on the b. t. u. contract basis, the dealers not having arrived at this point yet. Arkansas coal varies considerably, being high in b. t. u. and low in ash. It is very fine steam coal, but a poor, slow burner. Being unable to buy on a guarantee b. t. u. basis, and not using coal enough to warrant having an analysis made, we experimented with all the different coals in the field for short periods of time until we found which coal would evaporate the greatest amount of water per ton and leave the least amount of ashes. As a little instance of how easy a man is sometimes fooled in the purchase of coal, I want to tell you that I have a little hot water heater in the building, which works under practically the same conditions every day in the year, and in carrying on a series of coal experiments, with

this heater, we found that one ton of coal, costing \$4.50, lasted us six days and a half, while another ton, costing \$6.00, lasted twelve days, showing a saving of about 30 percent in using the higher priced coal. In plants that are not equipped to get fairly accurate records of efficiency, I think you will find it well to check the coal bill with the water evaporation by placing a water meter on the boiler feed pipe and checking the coal against the water consumption, and weighing the ashes one day in each week. By trying the different coals under these conditions, you can get a very good idea of which coal will give you the greatest efficiency.

Now, if you have arrived at a point where you are fairly sure about your coal situation, start experimenting with your fireman until you get him to a point where he knows how to keep a good, even, thin fire, and get every possible atom of efficient heat out of the coal.

We could talk this coal question from now till kingdom come, and I believe that even then there would be some questions left unanswered, so I will pass over the balance, and let these suggestions suffice for this dark subject.

Some building managers may contend that the oil used on your elevator machinery has no effect on the elevator service, but I am quite sure that it has, and find that I can get better operation out of the elevators because of the lubricating quality of certain oils. I believe castor machine oil is most generally used in the worm gears of the electric elevators, but I found, after experimenting with different oils, that vegetable castor oil was much the best lubricant. I have tried many experiments and asked lots of questions of the elevator manufacturers, discovering finally that two parts of number 2 castor oil mixed with one part of good dynamo oil, and this whole mixed with one-tenth part of flake graphite, gives excellent results—is a good lubricant, and needs to be changed but once a year. When you change this oil, if you mix it again with another portion of graphite, you will find it gives excellent and economical results as a guide rail lubricant.

No doubt you have all had trouble with lamps being stolen throughout the building. I have never heard of the problem being solved, and I don't know whether my solution is original or not; if it is, I hope you will all adopt it, and that you will find it is successful in keeping your lamps. Some tenants do not seem to have the least hesitancy about taking incandescent lamps out of the building for use in their own homes, and thousands of homes are constantly supplied with these lamps by the office buildings of the country.

When I purchased our lamps we made a contract to have every lamp etched with our name in a circle around the tip end, which showed up very clearly, and we figured that it would be improbable that a man would care to have a lamp with our name on it in his parlor; to say the least, it looks rather out of place, and we induced the electric light company to work with us to overcome the theft of lamps, and they instructed their employes that if any etched lamps were brought to them for exchange that they would refuse to exchange them and would take the name of the party presenting them and turn it over to us. This immediately, so far as we can tell, stopped all tendency to steal lamps from our buildings.

No doubt a great many of you have considered the question of baling the waste paper from your building, and I believe it would be a very good thing to do, and am just about to install one in our building. I find that

I can sell the waste paper in bales, F. O. B. St. Louis, at a minimum of 42½ cents per hundred, and that it can be baled and shipped, with all expenses paid, for about 20 cents per hundred pounds. The only bad feature is the fact that we are obliged to find storage room for a carload of paper; this proposition, however, I think can be worked out in a satisfactory manner. I have before me a report from the Nicholas & Spitzer buildings, Toledo, Ohio, who have had their presses in for some time. I understand that they received about 20 cents per hundred pounds, or \$4.00 per ton from the local junk man, who called every morning and removed the paper prior to their putting in a waste paper baler. After putting in the baler, however, they sold it at \$8.00 per ton, and at this price it shows the following revenue:

In six months they sold 26,000 pounds in one building for \$106.80, with a net cost of \$5.00 for freight and expense, leaving them a net return of \$101.80, or \$203.60 in one year. The other building sold 37,200 pounds of paper for \$148.80, with a total expense of \$5.00 for freight, etc., etc., leaving a net return for a year of \$287.60.

I have before me some figures compiled by one of the paper press manufacturers which gives the average statement of twenty-two users of paper baling presses, and for your information I give you this report as it was given me:

Average time presses in use, 11 months.

Average number of pounds of paper baled, 28,007.

Average gross returns, \$118.50.

Average cost of freight and expense, \$9.45.

Average net returns, \$109.05.

Average net returns annually, \$157.86.

Average net returns on the investment, 243 percent.

I also submit herewith a general report of paper baled and sold from nineteen states, as follows: Connecticut, Illinois, Kentucky, New Jersey, New York, Pennsylvania, Tennessee, Massachusetts, West Virginia, Iowa, Ohio, Maine, New Hampshire, Indiana, South Dakota, Michigan, Minnesota, Wisconsin.

Average time presses were in use, eleven months; average number pounds of paper baled, 23,225; average gross returns, \$92.45; average cost freight and expense, \$7.08; average net returns, \$85.37; average net returns annually, \$98.82; average net returns on investment of 134 presses, \$152.00.

Personally, this looks to me like a very profitable investment, even though there were no cash returns at all; the mere fact of having the paper securely baled and the building kept free from litter and refuse from this source would seem overwhelmingly in favor of the paper baler.

Last summer at Texarkana I thought I would get ahead of the paper baler people by using one of the many hay balers that are on the market, and save about \$35.00 or \$40.00, but after going into the matter very carefully I found that it took a different type of machine to bale waste paper than it did to bale hay; so I proved to be more of a farmer than I suspected.

There are so many systems of purchasing supplies and keeping records of them that it is difficult to set down any hard and fast rule by which to work. I find, however, that every manager I wrote to uses a requisition from the supply room, and a written order to the dealer. In

my own case, I keep all the supplies in one room in the basement in charge of the engineer, under lock and key. All material is purchased, on receipt of requisition, by the office on numbered written orders, in triplicate. The original goes to the dealer, duplicate remains in the office, filed under "supplies heading," and triplicate goes to supply room, where it remains on file until goods are received, when it is checked, O K'd and returned to office to be filed with invoice and voucher. The invoice is thus easily checked by this triplicate copy. Every piece of material is checked in the supply room and kept in its proper place.

For keeping a record of supplies going out, I am just working out a system, the idea of which was conceived from a certain register system. The form is like a grocery charge tab, containing space for item, amount, weight, floor, and a forwarding and balance column. We use one of these sheets for each kind of article and at the end of each month or period we have an exact record of supplies used on each floor, a permanent inventory and constant check, the recapitulation of which makes interesting study matter. I cannot give you the actual results from practice on this system as yet, but hope to be able to do so in a few months. I have studied it very carefully and believe it will meet every need successfully. All the old tools, supplies, lamps, etc., must be returned to the supply room before new articles are issued.

We have a card index purchasing record and keep records of purchase, date, quantity, freight, drayage and other necessary items for future information.

Every manager has hundreds of different articles presented to him every year, and he should be always open to be convinced of the merits or demerits of every one, to carefully test and try each new product, for there is no telling which piece of the cake contains the plums. Cost is a secondary consideration where efficiency is evident. I have had many other interesting deductions, but would not think of taking up more of your time just now.

Through the application of the above practices, I was able to reduce the operating expense in eight months' time from \$2,154 per month to less than \$1,100, and the installation of systematic operation increased the efficiency, cleanliness and general conduct of the building to such a marked degree that everybody sat up and took notice, and in a short time its vacant offices were being sought instead of seeking.



The Office Building Supply Department

By Frank McLean

BUYING supplies so that you may receive the most in quantity and best in quality at the lowest price is one of the chief concerns of managers of large office buildings, and they are forever on the lookout for the least advantage that may be had in making purchases at the most reasonable figure. Most managers will tell you frankly that they believe the matter of buying supplies the most responsible duty that falls to the lot of the men who undertake to keep the janitor service of the big buildings up to the highest efficiency at the lowest cost, and those who require a reputation for sagacity in this regard are considered the most desirable men that could be placed in charge of the large buildings.

Managers of the progressive type are always in touch with innovations introduced in the working departments of rival buildings that have proved a success. They are particularly anxious to know all about the operation of the engineering department of other buildings, as so many of the accessories of this department in the form of oils, greases, etc., are offered for sale by convincing salesmen that they are at times puzzled to know just what to do. However, the plan pursued by most managers when oils, greases, etc., of vaunted superiority are offered for trial is to telephone to the manager of a building that the salesman insists has been using his products with unmeasured success and find out just what results have been achieved. If it is learned that the oil or grease really has merit the manager who is asked to give it a trial in his building will govern himself accordingly, and it has been found that mistakes have seldom been made when this plan has been followed. Also, the engineer is relieved of responsibility for poor judgment if the item proves to be unsatisfactory, and in addition he avoids the imputation of favoritism in recommending this or that company's produce. However, most managers assert that the average engineer is so determined to have all of the machinery of his department working smoothly that it is to his benefit to secure the best oils and greases that can be obtained, regardless of who manufactures them. It is for this reason that the engineer is relied on in testing samples, although in rare cases favoritism might develop.

Building managers who are recognized as the most astute in the matter of dealing with the janitor problem and the purchase of supplies insist that there is only one way to conduct the supply end of the management and that is to confine the buying exclusively to the manager. The plan that has been followed in many buildings whereby the engineer is permitted to give the order for supplies needed for his department and the heads of the other departments to do likewise has been found to be decidedly unsatisfactory. The reason for this is that there is too much confusion when orders for supplies are given by all the department heads, and, furthermore, there is opportunity for favoritism to develop—one of the menaces to successful management of buildings that should be avoided above all others. Variance in prices quoted during periods in which sup-

plies were purchased by department heads and while purchased on requisition from the manager's office was convincing enough to the head of a large Chicago office building to cause him to issue an order that in the future all supplies, no matter what the price, must be procured on the "O. K." of the order by the manager, otherwise the bill would not be paid under any circumstances. The department heads, who at first were rather disposed to ignore the rule, when they found that in order to procure some item that they might need for emergency use and which might cost less than one dollar, they must first secure a requisition from the manager's office, finally came to realize that the plan would prove the best after all, and today they assert that they much prefer to work under the new system than under the old.

"We have had the requisition plan in effect here for a long time," said J. E. Randell, manager of the Commercial National Bank building, Chicago, "and it has proved so satisfactory that all of the department heads have become convinced that no other system could work as perfectly. In the first place, if the engineer or janitor should want to purchase this or that item their order must be approved by me, which puts me in the position of knowing just what is wanted and when it is wanted. Not a single item can be purchased for the building without a requisition from me, and in case any bill should be presented without my first knowing that I O. K'd. the order I would refuse to honor the bill. Again, in the event that a bill through some confusion should be presented a second time all I would have to do would be to refer to our perfect index system to know just what was ordered, when ordered and whether the bill had been paid. Even if an item were sent on approval, I would not honor it when I found that an order had not been O. K'd by me.

"The principal feature of the requisition plan is that it prevents the supply houses from playing politics with our employes. There was a time when a representative of a supply house might call at the building, see the janitor or engineer, slap them on the back, present cigars and then expect to get an order. But on the requisition scheme the department heads have only to say to the representatives of supply houses that they have nothing whatever to do with the buying of supplies and will refer them to the manager's office. The supply house men realize that this thing of tossing over a cigar to the manager of the building will have no effect, and the best that they can do is depend upon price and the quality of goods. However, at times when some supply man happens to drop in on the engineer with some item that it is evident is superior to an article that we might have been using for some time, the engineer will take the man up to my office to talk over the matter. I generally insist that the supply house forward us an order on trial, believing that if the item has merit the house will not be afraid to let us give it a trial. When the supply house man that might visit the building is merely one of the regular callers, the engineer will advise him forthwith that it is no use wasting words with him, but to go up and see the manager. Our department heads have become so satisfied with the requisition system that they tell me they are pleased to have the responsibility of buying taken off their hands, and that since we have introduced the plan in every department of the working force results have been beyond expectations, and we would not think of changing to the old system under any circumstances. Furthermore, the requisition plan makes it much easier for my

office help to keep track of orders and bills, and I can say that not once a year do we have any confusion in the matter of bills being presented a second time for payment or anything of that sort. The original order is sent to the supply house and we keep duplicates in the office."

Mr. Randell asserts that he always keeps in close touch with his help, advises with the engineer and other department heads from time to time to find out their needs and makes his purchases accordingly. He reposes the utmost trust in his men, and whenever they tell him of a certain item that they believe is worthy a test he gets into touch with the supply house and arranges for a trial. The average department head will gauge his conduct according to the conduct of the manager, and when he finds that the latter is capable and conscientious the department head will do everything in his power to develop a high standard of efficiency.

The Commercial National Bank building buys 100 boxes of bar soap at a time, there being sixty bars to the box. The soap is placed on racks to dry and is left there three months. In this way about 75 percent of the soap is saved. Each of the scrub women is given two bars of the soap a night. In the purchase of soap powders a quality is procured with just enough soap to make the mop slip over the hall floors. The water and soap take off the dirt, while the grit cleans it off. When powder containing a high percentage of soap is used the marble floors become too slippery, a condition that most building managers seek to guard against. Mr. Randell buys five barrels of the powder at a time. It is placed in bins which slope down with a sliding door, and the receptacles are filled each night after the stockman weighs the powder. By the weighing process it is possible to tell to an ounce how much powder each worker will require for a night's work. For a long time Mr. Randell found that the floors were too slippery, and he soon realized that the reason for this was that the workers were using too much of the powder. Ten thousand bars of soap and 26,000 pounds of soap powder are necessary to keep the building clean for one year.

The dusters used in the Commercial National Bank building generally last about three months, and after their usefulness for dusting furniture, desks, etc., has expired they are used for transoms, shafts, etc. Special care is used in their selection. It is in the purchase of sponges that the manager must use his good judgment, as it is possible for the supply house to practice much deception by adding false weight in form of sand, gelatine, etc. The prices of the sponges range from \$2.50 to \$3.25. The \$2.50 sponge is invariably filled with sand, gelatine, etc., and is what is known as a "fill" sponge. The kind used by the Commercial National Bank building run five or six to the pound. Mr. Randell keeps in close touch with the daily market quotations and buys by the bale when the price is lowest.

Buyers must also be on their guard in the purchase of chamols skins, French and American. Some are thick and others thin. They are sold by the "kip," or thirty skins, at from \$7 to \$15 a kip. This skin is used to clean windows and should be of uniform thickness.

The most serviceable broom for the larger office buildings has been found to be one of five reinforcements. In most of the large buildings it is customary to purchase a stock of brooms that will last three months.

Make a Profit from Waste Paper

THERE is perhaps no waste product about a building from which a better profit can be made than waste paper if it is judiciously sold. The usual practice is to have the baskets of paper emptied into bags. These bags are stored in the basement and are removed by the junk man about once a week.

The dragging of these large bags full of scraps of paper through the halls is sure to stir up more or less dust and litter, and often admits a number of people to the building that, to say the least, require watching.

None of the superintendents are particularly anxious to talk on the subject, as it is a delicate matter. In fact, the manager of one of the largest buildings in the world said: "The less you say about waste paper, the better. There is no use stirring up the insurance people in regard to this matter."

The whole subject of waste paper is a troublesome and perplexing part of the management of a building, and scarcely any concern handles its waste in a scientific and thoroughly modern manner. Any fair-sized office building has at least a ton of waste paper a week, and is able to dispose of it at the rate of about 25 cents per hundred pounds. In some of the smaller cities it is given away, and in others a man is actually paid to remove this waste paper.

The price of all paper has gone steadily up in the last ten or twelve years, and the gradual shortage of wood pulp means that the price will steadily advance, and this by-product of a large building, under proper management, could be made to pay a profit.

One of the managers interviewed had a small hand-baling press installed in his basement that would hold about two hundred pounds of paper. As fast as the waste was received, it was dumped into the press and kept under cover and pressure until enough was accumulated to make a bale. When the press was full, the lever was applied and a neat, compact bale was the result.

This practice did away with the fire risk, which is of vital importance to every manager. The idea of a bin or a room half full of waste paper, some of which might be oily, lying loose for an entire week, is a matter about which the superintendent does not care to think of any more than is necessary. It is a good thing to conceal from the insurance inspector.

Before our friend installed a press he received about twenty cents per one hundred pounds for his waste paper, but now he is enabled to get enough more so that he hopes to pay for his press inside of a year.

Aside from the advantage of neatness and compactness in the storing of the paper and the advance rate that can be received, the great point should be noted by every building superintendent, is the fact that all this waste is kept under heavy pressure, so that the danger of fire is greatly eliminated.

A letter from the Underwriters' Association as follows substitutes the statement:

"We encourage the use of baling presses, as otherwise paper is permitted to accumulate and is very often the cause of serious fires. While there is no provision for a credit in the schedules used in rating, we are very often compelled to make an additional charge in the fire insurance rate when waste paper is strewn over the floor, which does not occur where a press is in the risk."

Not only does the manager make money by selling his waste paper, but he insures himself against fire to a great degree. The paper, in baled form, will not burn, as it is pressed so tight. Space also is economized, for pressed paper takes up about one-half the room that the loose paper requires.

The prices on the ordinary grades of waste paper vary considerably, but we will give you the extremes.

Mixed papers sell for as low as \$8 per ton delivered, and as high as \$18 per ton delivered. News as low as \$9 delivered, and up to \$20. Blanks and No. 2 shavings as low as \$18 and as high as \$27. No. 1 shavings as low as \$32 per ton and as high as \$45.

To get this scrap to the mills, the paper must be baled, and paper baled is worth at the mills from 50 to 100 percent more than the above figures. This is how you bale the paper: Use the press as the receptacle for your waste. As you empty the paper into the baling case it is closed up.

Four or five minutes' time a day will mean from \$1.00 to \$1.50 worth of scrap in shape for market every day. It actually takes less time to handle paper this way than to carry it out in an alley and burn it or have it carted off.



Buying Coal for a Building

OWNERS and managers of large buildings probably buy for their heating and power plants more coal than any other one class of consumers. Still, owing to the lack of co-operation, each individual has had to take what is given and pay what is asked. The few exceptions to this rule have been where owners and managers have formed local associations and pooled their interests, forcing more advantageous prices by sheer weight of their buying power.

The full study that is now being given the matter should result in establishing some standard of value for all grades of coal that shall be equitable for the dealer and more economical for the consumer.

Of course it is not merely coal that is wanted; it is available energy, and judged by the standard, it is obvious that weight is not a good measure of value. Much has been said of late years in this connection about buying on the basis of thermal units, and large consumers have found no basis that meets their need more perfectly; still, it is admitted that the best of contracts and specifications made on this basis have not been wholly satisfactory.

The purchase of coal, like any other purchases, should be based on results desired, but these results in coal depend quite as much on the adaptability of the fuel to the furnace, chemically and physically, as upon the number of thermal units the coal will yield.

In one of the United States geological survey reports it is pointed out that coal highest in British thermal units is not necessarily best for a given purpose, even though it be completely burned, and cites as an instance that coals high in volatile matter are the most difficult to burn efficiently, although they are high in British thermal units. Furthermore, coals of nearly the same percentage of volatile have different heating powers on account of the presence of heavy hydrocarbons and tar, or volatiles which are not combustible at all.

Again, the heating of coal, designated by British thermal units, varies in a general way with the proportion of other impurities or foreign matter which displace the valuable carbonaceous and heat-producing material. This foreign matter consists of earthy impurities, with the exception of moisture, form ash, and although the percentage of ash can be pretty accurately determined, this percentage does not always represent the ratio that the heating value is reduced or increased by the presence of the impurities which make the ash.

This is due to the fact that though generally the constituents of ash are earthy in character, consisting of slate, bone, etc., the chemical relation they bear to the carbonaceous elements vary greatly. Ash retards the heating value of coal not only because it displaces the carbons, but because it serves also to envelop a portion of the heat-giving elements. For instance, a coal having a calorific value of 12,300 British thermal units and 16 percent ash, has 84 percent of combustible matter. It has been

demonstrated that the combustible matter, replaced in 1 percent of ash, is equivalent to about 150 British thermal units, while each percent of ash envelops under ordinary conditions an equivalent amount of heat units. In other words, each additional percent of ash means a decrease in the calorific value by about 300 British thermal units. Ash, is also responsible for a decrease in available heat units, due to such causes as the removal of ashes heated to a high temperature, the inrush of air, due to the necessity of frequently cleaning fires, and the loss by the excess of air, due to cavities forming in the fire bed.

The important bearing that the percentage of ash occurring in coal has upon cost of operation can best be appreciated when it is considered that each percent of ash is equivalent to 22.4 pounds of coal per long ton of coal. A ton of coal running 20 per cent in ash has 448 pounds of ash, so, in five tons of coal may be rejected if it shows more than 1.5 percent sulphur in anthracite or 2 percent in bituminous coal.

Moisture seems to be the one element the amount of which it is easy to measure accurately, and the relation of which to the heat-producing value of coal is generally recognized. In buying coal, however, the moisture it contains is not given the attention which its importance deserves; for instance, in winter when shipments are exposed to heavy falls of snow and rain it is not unusual to find coal running as high as eleven percent in moisture. Frequently, too, ice forms in the cavities, and this weight is added to the weight of the coal. Not only is there a great loss in weight, but the heat units necessary to evaporate this moisture take just so much from the efficiency of the coal.

There are always two ways of determining efficiency—theoretical and by actual test. Science has developed so far that frequently, or we might say generally, the one proves the other, but when there is a discrepancy, have abandoned or ceased to depend on the analytical tests in favor of the figures which the scales (for coal and ashes), the water meter, the recording pressure gauge and the recording electrical meters show. It has been found that it is far more necessary to determine carefully to what degree of efficiency the respective pressure gauge and the recording electrical meters show. It has been found that it is far more necessary to determine carefully to what degree of efficiency the respective kind and size of coal can be used in the grates, and the conditions under which the plant must operate, than it is to get that coal which shows by analysis the smallest percentage of ash and the highest British thermal unit. High percentages of combustible in the ashes actually removed means a greater loss than high percentage in the analysis, and this condition is almost invariably due to unsuitability in the design of the grate, the force of draft used, and the size of the coal fired. Then, too, the personal element is a factor to be reckoned with.

All this does not lessen the value of reliable analytical tests, but, as above suggested, the practical should supplement and be a check on the theoretical.

Having determined what coal is best suited to the needs of a particular plant, the real problem comes up by what standard to determine its money value.

The Government method is to request bidders to quote prices on the various sizes of anthracite, a definite standard of quality being specified for each size, and to furnish the standard of quality with the price of bituminous

coal offered. Awards are then made to the lowest responsible bidder for anthracite, and to the bidder offering the best bituminous coal for the lowest price, the proper award being determined as shown further on.

The specifications become a part of the contract, the standards of quality forming the basis of payment for coal delivered during the life of the contract. For coal delivered which is of better quality than the standard, the contractor is paid a bonus proportionate to the decreased value of the coal. The actual quality and value of coal delivered is determined by analysis, and the test of representative samples taken in a specified fuel-testing laboratory at Washington.

In determining the award of the contract, consideration will be given to the quality of the coal offered by the bidder, as well as to the price per ton, and should it appear to be to the best interests of the Government to award the contract for supplying coal at a price higher than that named in lower bid or bids received, the award will be so made. The right to reject any or all bids and to waive defects is expressly reserved by the Government.

Coal must be delivered from the car without being screened, but must be reasonably free from dust and fine coal.

To receive consideration, bids must be based upon the following percentages of ash for various classes of coal:

Furnace	10%
Egg	10%
Stove	12%
Chestnut	14%
Pea	16%
Buckwheat No. 1	18%
Buckwheat No. 2	18%

Coal with less ash than the standard will be paid for at a higher price and vice versa, in accordance with the provisions for payment.

It is understood that the coal delivered during the winter will be of the same character as that specified by the contractor.

Coal containing more than one (1) percent of sulphur, an excessive amount of dust and fine coal, or a percentage of ash in excess of the maximum limits, indicated in the following table, will be subject to rejection:

Furnace coal	14%
Egg	14%
Stove	16%
Chestnut	18%
Pea	20%
Buckwheat No. 1	21%
Buckwheat No. 2	21%

An example of the way premiums and penalties are figured on the amount of ash is as follows:

For buckwheat (dry) the standard is from 17.01 to 19.01 percent.
 For 16.51 to 17.00%..... 4c per ton premium is added.
 For 16.01 to 16.50%..... 6c per ton premium is added.
 For 15.51 to 16.00%..... 8c per ton premium is added.
 For 15.01 to 15.50%.....10c per ton premium is added.
 For 14.51 to 15.00%.....12c per ton premium is added.
 For 19.01 to 19.50%..... 4c per ton penalty is deducted.
 For 19.51 to 20.00%..... 8c per ton penalty is deducted.
 For 20.01 to 20.50%.....14c per ton penalty is deducted.

For 20.51 to 21.00%.....21c per ton penalty is deducted.

For 21.01 to 21.50%.....32c per ton penalty is deducted.

For 21.50 to 22.00%.....48c per ton penalty is deducted.

Payment will be made on the basis of the price named in the proposal for the coal specified therein, corrected for variations in heating value and ash, as shown by analysis above and below the standard established by the contractor in his proposal. For example, if the coal contains two (2) per cent, more or less, British thermal units than the established standard, the price will be increased two (2) percent accordingly.

The price will be further corrected for the percentages of ash, as shown above.

With certain variations, this Government plan of buying is the one followed by most municipalities and other large buyers. All forms of contract have some form of premium or penalty, the range of which permit of considerable variation in the grade of coal delivered. This is in a measure overcome in some specifications by requiring the bidder to name the location of the mine and designation of the seam from which the coal is to come, but in any competitive plan it is almost impossible to get any great degree of uniformity, which is, after all, the thing most desired, for, by experimenting, draft and method of firing can be adjusted to any grade of coal, but the necessity of frequent adjustment is far from desirable.

It is natural, too, that a contractor should have his estimate with respect to the penalty, to safeguard himself in determining his bid. In actual practice it has been noted that the same coal for which good premiums have been paid could have been bought much cheaper in the regular way at circular quotations.

Still another practical difficulty is in electing the samples for analysis. Here the personal element has to be reckoned with, and inspectors are likely to take samples from the tops of loads or places most easily accessible; then the samples are likely to be sent to the laboratory in receptacles not air-tight. The specifications of the Boston Board of Education endeavor to guard against this by not following provision, which, of course, is not altogether practicable:

The sampling shall generally be conducted in the barge or vessel itself. One sample at least shall be taken from every shipment, its size varying with the size of the cargo, but for quantities of 500 tons never being less than 300 pounds. This sample shall include lump and fine coal, in as near the proportions in which they occur in the shipment as possible; for small cargoes it shall never be taken from less than twenty-five places, equally distributed through all parts of the cargo, while for larger cargoes the sample shall come from a proportionately larger number of places. All the coal taken out shall be reduced to $\frac{3}{4}$ -inch size or smaller, thoroughly mixed, and systematically quartered down like an ore pile. The coal shall be crushed finer after every quartering until about twenty pounds remain, opposite diagonal quarters, from which two quarters shall serve to form the main sample for moisture and analysis, while the other two quarters may be taken to serve as a check sample for analysis. The main sample shall immediately be transferred to an appropriate container, provided with a tightly fitting cover and taken to the laboratory, where it shall at once be weighed.

Even though it has not been practicable for moderately large consumers, like building managers, to buy on the thermal unit basis, extensive

inquiry has shown that analytical tests carefully conducted has served to put an effective check on the delivery of inferior coal. Some companies operating large properties have their own laboratories, and in New York it has been found convenient and profitable by some managers to employ the services of a fuel-testing company, whose experts make periodical visits of inspection, not only for the purpose of testing the coal, but to make independent technical reports on general condition of the steam producing equipment.

It is easy to see how much more weight a protest to a coal company would have if it were accompanied by actual evidence of inferior quality, and even though the premium and penalty plan is not applied, it is certainly fair to have some understanding in the contract about minimum British thermal units and maximum ash. The following shows a very good standard for such contract for anthracite:

Name of Size of Coal	Minimum allow- able B. T. U. per lb. Dry coal.	Maximum allow- able moisture per cent. As sold.	Maximum allow- able ash per cent. Dry coal.	Maximum allow- able sulphur per cent. Dry coal.	Maximum allow- able volatile com- bustible matter per cent. Dry coal.
Broken egg, stove and chestnut....	13,300		11	1.5	8
Pea	12,300	4	16	1.5	8
Buckwheat, No. 1, 2 and 3.....	12,200	4	17	1.5	8

Standard for semi-bituminous:

Name of Size.	Minimum allow- able B. T. U. per lb. Dry.	Maximum allow- able moisture per cent. As sold.	Maximum allow- able ash per cent. Dry.	Maximum allow- able sulphur per cent. Dry.	Maximum allow- able volatile com- bustible matter per cent. Dry.
Run of mine	13,600	2	12	2	22
Slack	13,300	2	14	2	25



PART VIII

Elevators

Elevators: Their Types, and Rules for Their Care and Operation

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THE word "Elevator" is applied to machinery used to raise or lower a cage, car or platform between fixed landings. The principal parts are (1) the motor or motive power used for traction, (2) the car with guides and counterbalance weights, (3) the controlling devices, (4) the transmission, and (5) the safety appliances.

Elevators are classed according to the motive power used for their operation, the most common types being hand-power, steam, belt-driven, hydraulic and electric.

On every elevator, regardless of type or motive power, the weight of the car is counterbalanced. This is done so that its entire weight is not a dead weight but only the difference between the weight of the car and the counterweight. The counterweight must necessarily be lighter than the weight of the empty car and fixtures so that the car may descend when empty by its own weight, the power necessary to raise a car being only sufficient to raise the load plus the unbalanced weight. Counterweights are generally cast-iron blocks carried in a frame and run in guide ways usually constructed of T iron.

An elevator is overbalanced when the power must be applied during both the up and down trip. This, as a usual rule, is done in all drum elevators, these being supplied with the reversible drum and motor.

As there are now only two types of elevators in general use, namely, the electric and the hydraulic, this article will be confined to these.

The different types of electric machines may be classified as (1) Traction, (2) Worm Gear Traction, and (3) Worm Gear with Drum on which the cables are wound and unwound.

The traction type elevator is one with a motor connected to a grooved sheave or wheel, the cables from the car going around this wheel and over an idler, then back over grooved wheel to the counterweight. In other words, the counterweight on one end of the cable and the car on the other holds the ropes to the grooved wheel tight so as to make them wind and unwind as the motor turns the wheel.

In the Worm Gear and Drum types, whether machine is located in the basement or at top of hatchway, the hoisting ropes are wound on a drum. These ropes are always in duplicate, there being four ropes, two for the car and the other two for the counterweight. The only difference between the Direct Traction and the Worm Gear Traction is that in the latter, instead of having the traction sheave directly connected to a motor as it is in the former, the motor is operated at a higher speed, and the traction sheave is operated by a worm gear, reducing the speed of the motor to the speed required for hoisting. The advantage that the Worm Gear Traction has over the Drum Worm Gear is purely a matter of greater safety.

Hydraulic elevators today are considered the safest kind in use. They

may be classified as (1) Horizontal, (2) Vertical, (3) Plunger and (4) Piston types.

The simplest form of these is the direct acting or plunger elevator, which is considered very good for either freight or passenger service, and shows a high degree of efficiency, but this type is not as generally used as the piston type because of the great amount of space necessary for its operation, and the large volume of water it requires, this owing to the fact that the hydraulic cylinder and plunger have a length equal to the lift, which is obviated in the piston elevator by the introduction of multiplying sheaves. In the plunger elevator the power is exerted direct without the use of sheaves or cables, the car always being supported from beneath, there being no necessity for providing it with safety appliances such as are used on other elevators. Owing to the fact that the cylinder necessary to be sunk must have a length equal to the car travel, the cost of driving for the cylinder has a considerable bearing upon the cost of installation. This type of elevator, therefore, is not used in cheaper constructions.

The hydraulic plunger elevator built by the Otis Elevator Company differs from other hydraulic plunger elevators in the respect that when it is lifting the load, there is no water consumed, but it is being discharged from the cylinder. In this the plunger, being of solid steel and very heavy, lifts the load. The plunger descends into the cylinder as the car goes up. As the car is reversed and comes down, the water is pumped up to the required pressure; this plus the weight of the car raises the plunger. This type of elevator was designed to meet the requirements of high building service. It is very economical in operation, may be operated at very high speed, and very quickly started and stopped. This machine is usually operated on a medium pressure, seldom going above 250 pounds per square inch. On this account it is possible to use the compression tank system. The compression tank is placed in the basement and the discharge tank either on the roof or in a location where it will be at least as high as the top of the cylinder so that the cylinder will always be filled with water, this acting as a safety brake.

Controlling Devices: There are two systems of control, namely, electrical and mechanical. In the former the elevator is controlled by a small switch, within the car operating pilot circuits, which opens and closes the main line and reverses switches. When starting, there is great resistance within the armature circuit, and as the motor picks up speed this resistance is automatically cut out step by step by electrically operated switches, and by this means the current is prevented from increasing above the amount for which the motor is designed, and a gentle, smooth start is secured proportionate to the load.

The mechanical system of control differs from that just described. In this the line switch is opened, closed and reversed by a lever or a wheel within the car by purely mechanical means. The closing of the switch admits starting current only to the motor and thereafter the control proceeds in the manner already described. The starting resistance is cut out from the armature circuit by automatic switches step by step as the motor gains in speed, the same protection of the motor against heavy current being thereby assured.

Elevator Safety Devices: All passenger cars that are hung by cables should have speed governor safety device equipment. This device will stop a car if for any cause it should get from under control. Running away may

be caused by any of a number of conditions, but less danger is to be feared from breaking of the cables than from some derangement of the mechanism which might permit the car to gain a dangerous momentum. This speed governor is provided to throw the safety device on the car into action when the car has attained a certain fixed speed in feet.

The speed governor must, of course, be set somewhat in excess of the normal speed of the car so that it will not be likely to interfere with the normal running of the elevator. If a car runs normally at a speed 250 feet per minute, the speed governor ought to be set to trip when the car reaches, say 450 to 500 feet per minute. There are numerous devices for this purpose on the market, and when installing, some care should be exercised to select the one that will arrest the descent of the car with the least shock, thereby avoiding injury to the passengers. On the plunger elevators this device is not necessary on account of the remote probability of the car falling.

Freight elevators should be equipped with a breaking safety device, so that in case the cable should break the springs would cause the device to grip the guides and stop the car, and it is also a good practice to have a speed governor safety attachment. One of the most frequent causes of freight elevator accidents is the breaking of the gearing in the winding mechanism, thus releasing the drum and allowing the car to drop, pulling the cables with it.

Safety devices should be examined at regular intervals to make sure that they are in perfect working order. In the case of a breaking safety device it is only necessary to block the car so as to get slack cable and then test and determine whether the safety holds. With the speed governor safety appliance, a thorough examination will, as a rule, show with fair certainty whether the appliance will act in case of an emergency or not. But, rather than rest in doubt, a running test should be made even on these.

All cars should also be equipped with a switch for throwing out circuit breaker. The safety devices ought to be inspected and cleaned at least once a week, and ought never to be allowed to get gummy from grit and grease. Sometimes the safety wedges are thrown in without apparent cause. This may be due to weak spring or dirt on the guides. Guides are often so dirty that the spring cannot prevent the wedge from catching. Always be sure where a weighed sheave is used on the governor cable that it is always suspended and not resting on the ground or the bottom of the shaft, as this will cause the cable to slacken and may throw it off the sheaves. Neglect in the inspection of this governor rope has been the cause of a great many accidents. This rope should receive inspection even more frequently than the hoisting cables and ought to be kept in just as good condition. By so doing, serious accidents may be prevented. The jaws or wedges of safety devices must always be kept clean and properly adjusted in order to attain effective operation.

Elevator Cables: The most serious deterioration in elevator cables is due to the continual bending over sheave wheels or drums when under stress. This increases with the increase in speed or load. In order to have more work done, it is better to increase the load rather than the speed, as increasing the speed will wear out the cables a great deal quicker than increasing the load.

All elevator cables should lead as straight as possible and idlers should be avoided wherever possible. The cables should be so arranged that in their travel they will always bend in the same direction and bear on the

same side of the sheaves if possible. Cables will break very quickly if passed under one sheave and over another. Care should also be exercised to have the grooves of drum, sheaves and pulleys of the proper size and perfectly smooth in order to accommodate the cables, the grooves being neither too small nor too large. It is also essential that the pulleys, drums and sheaves be in perfect line with the cables so that the cables will not wear or chafe on the side of the groove. Insurance companies consider that the highest efficiency in a cable is reached when abrasion of the wires is such that they are worn nearly half through before they begin to break. The length of time that it will take for this to occur depends, of course, on the amount of work being done by the cables. In ordinary passenger elevator work, about two years of constant service is considered a good life. I believe that the time will come when elevator cables will be purchased on the basis of mile travel. If the wires in the cable are found to break off before any great amount of abrasion has taken place, and the cables have been used only a comparatively short time, they should be considered of poor quality and for safety sake be replaced as soon as possible, providing, of course, that this is not due to the cables passing over too small a sheave or the grooves in the same not being of the proper size.

Elevator cables and counterweight cables of standard size are composed of six strands of nineteen wires each with a well lubricated hemp center. A cable with less strands and fewer wires is sometimes wrongly recommended and purchased. Owing to lesser flexibility this cable should not be used, as its deterioration is very rapid. It is, however, not necessary to replace a cable immediately when the wires begin to show wear, but when they do, they should be watched very carefully and inspected at frequent intervals. In the beginning only a few wires may be broken, but later they begin to break rapidly. A very sharp watch should be kept and as soon as from 25 percent to 35 percent of the wires in adjacent strands are found either badly abraded or broken, the cable should be discarded and replaced by a new one. No cable should be used for passenger or freight service when the deterioration amounts to more than 35 percent.

It is often found that the wires begin to break on the inside of the cable first. This may be detected by noting broken wires down in the lay of the rope or in that part where one strand becomes covered by the one beside it. Wherever this condition is found, it is dangerous to take any chances and the cable should be at once replaced, as it is impossible to tell how many such breaks there may be. Elevator cables require lubrication much for the same reason as do high speed bearings or other rubbing surfaces. Therefore it is essential when purchasing cable, that the amount of lubricant in the hemp center be ascertained, as it is difficult to lubricate the center of a cable after it is installed. Any good, liquid lubricant, free from acid, may be used for this purpose. When putting in new cables, it is good practice to thoroughly saturate them with raw linseed oil, or a compound of one part graphite to five of cylinder oil. This will soak in to the center and make amends, in a measure, for what was neglected in the manufacture. The failure of wire cables may be attributed to one of three causes, viz.: crystallization in the wire, internal abrasion or wire cutting, or external abrasion and wearing of the wires. Crystallization in the wire occurs most commonly in cables that have been in use for some time, and it is very difficult to detect this in its early stages. The second and third causes are, however, mainly responsible for the majority of failures in elevator ropes.

The tensile strength of the metal used in elevator cables, according to the manufacturers, may vary from 90,000 to 100,000 pounds per square inch, and owing to the peculiar wear to which elevator cables are subject, it is extremely necessary to use caution as to the factor of safety. In the case of new cables, this should be from six to seven, and as the cables grow older, this factor should be gradually increased, but where the speed of the cables is excessive it is better practice to allow a factor of safety of from eight to ten. Frequently one or two of the lifting cables will crack or wear badly and the other cable remain in good condition. It will be found economy, instead of changing the inferior cable to change them all, for when the new and old cables are used together on one car, the old cable having had a full stretch and the new cable having had none, practically all the strain is on the old ones, this causing them soon to be in the same condition as the ones just discarded.

Lifting or counterweight cables must never be spliced under any circumstances. All water and moisture should be kept away from the cables as the deterioration from rust or corrosion is very rapid.

Some Excellent Rules for Elevator Operators.

1. Always start and stop your elevator gradually. A sudden start or stop may throw the cables off the sheaves and subject the entire machine to severe stress and danger of accident.

2. Never allow your elevator to be overloaded. When the car is comfortably full, request the remaining persons to ride on the next elevator, and close your door.

3. Always make sure that the passengers standing nearest the door, or opening of the car, are well within the car.

4. Never start an elevator until the door on the landing is closed and latched, and do not open the door on a landing until you have brought the elevator to a full stop.

5. If the hand-rope is too tight or too loose, report it at once to the engineer, who will adjust it properly. (The tension of the ropes changes with the condition of the atmosphere.)

6. Be careful in running an elevator on the down motion. An increased load means increased speed, and the speed should be watched. Never try to show how fast the elevator can run on either up or down motion.

7. If you are running an elevator that is operated by a lever or wheel, never reverse the lever or wheel without care. First bring the car to a full stop, then move your lever or wheel in the direction you desire to go.

8. If for any reason the safety device should operate and the car become pawled, don't touch the hand rope or try any experiments. Send for the engineer in charge. Meanwhile keep cool, and keep your passengers from attempting to get out, as that is very dangerous.

9. Should your elevator, for any cause, refuse to go either up or down, bring the hand rope, lever, or wheel to the center and leave it there. Don't try any experiments, but send for an engineer.

10. If you are running a belt elevator, be sure to pull the hand rope or hand chain as fast as possible on either motion. By doing so you throw the belt full on the tight pulley, and thus prevent it from slipping. In stopping, use the check rope.

11. If a belt elevator does not hold a load properly when it is stopped, report it to the engineer or person in charge. The brake requires adjusting, which is important.

12. If you are running a steam elevator, be sure to center the hand rope or hand chain when stopping the car, and if the elevator creeps after it is stopped, report it at once. The brake requires adjusting, which is important.

13. If you have a large amount of merchandise to take upstairs, it is safer to make two loads of it than to attempt to carry it all in one load.

14. If you are running an electric elevator, always center your hand rope, lever, or wheel, when stopping, for if you fail to do so you are liable to burn out parts of the starting box and motor. Electric elevators should never be overloaded, for the moment the load exceeds the lifting capacity, the fuse burns out, the elevator cannot be operated until a new fuse has been put in.

Never use a piece of wire as a substitute for a safety fuse, for in such case you are bound to burn out the entire machine sooner or later.

15. If there is anything about the elevator that does not appear to be just right, or if you hear any unusual noise in or about the machine, report it at once to the engineer or person in charge. If the engineer cannot determine what the difficulty is, he should telephone or send at once to the office so that the manufacturers may be communicated with and expert advice secured.



Elevator Erection and Maintenance

By J. A. Martin

THE natural consequence of the advance in elevator construction, which had its beginning in the early '70s, and the steel skeleton construction of the modern building introduced about 1890, have altered the face of the greater cities of the world, especially those of America. It has produced the magnificent towering structures of today and has created three or four cities, one on top of the other, in all the greater business centers of our land, and has placed in a single building the population of a town.

When we consider the few accidents that occur, we have a convincing demonstration that the up-to-date elevator is the very safest vehicle of human transportation. I have been unable to obtain any very complete figures, but the following will serve as a comparison—being obtained from the New York Times of December 31, 1911: "For the preceding year we find that the loss of life in the United States from elevators is given as 65, from automobiles 784, marine disasters 1817, and in mines 931. These statistics show that the loss of life in elevator accidents is exceptionally small."

The cost of the operation of elevators varies greatly, governed as it is entirely by local conditions, so that any information in a general way would, no doubt, be very misleading, as there are so many variable items by which it can be affected. In the electric the cost will vary widely according to the service which is required from the elevators. Also, for the worm-gear traction or the drum type machine the cost will vary with the type of current available; that is, whether it is alternating current, single or multi-phase, or direct current. You can appreciate that in a hotel where the loads are very light and where there are possibly only one or two stops made per trip, the service cannot in any way be compared to the conditions which would have to be met in a department store or large office building where the cars are usually loaded to their full capacity, and where stops are made at all floors. These conditions are probably the extreme limits of passenger service and the other types of buildings will come between them. Another condition which will affect the cost of operation is the question of whether the current is generated at the building or whether it is bought from a power company. If the current is generated at the building there are a number of overhead charges which should be included, but which oftentimes are not figured in the cost of power.

In the case of hydraulic equipment the variation is not dependent upon the conditions which govern in the electric elevator, but are more particularly dependent upon the source of obtaining the power. The type of pump will make a large variation in the cost of power, owing to the variation in efficiencies. The quality of the steam with the steam pump, the relative location of the pumps and boilers is very important, as the quality of the steam is materially affected. In some cases, in larger cities, the steam is obtained from the service mains of an outside company, and the

economy of the plant is largely dependent upon the location of the building with respect to the power plant. In some cases the exhaust steam from the pump is used for other purposes in the mechanical equipment, and this arrangement, of course, increases the efficiency of the mechanical plant. From this you can see that it is an extremely difficult thing to give any definite cost of operating per car mile for either the electric or hydraulic type of elevator. From the most authentic source, however, I have found that for these various types the cost will probably vary as follows: The gearless traction elevators, 5 to 20 cents per car mile; worm gear traction elevators, 8 to 30 cents per car mile; hydraulic elevators, 8 cents and up, depending upon the many conditions which I have noted.

The hydraulic elevator, up to within the last few years, has been the only type of elevator capable of handling heavy freight and passenger traffic. The first important installation of hydraulic elevators in America was in the Borell building, in New York City, in 1878. The elevators were of the vertical cylinder type and through their success indicated that in a short time the steam elevator, which had previously been used, would give way to the hydraulic, just as at the present time the hydraulics are giving way to the improved type of electric elevators. Up to 1890 there was no marked improvement in the hydraulic elevator except in detail of design and construction. At about this date the demand for increased speed compelled the abandonment of the hand rope control, and then the pilot valve and lever valves were introduced. The first wheel valve and pilot valve ever used were designed for and installed in the Eiffel tower at the Paris Exposition in 1889, and shortly after similar but smaller pilot valves were installed in New York City. The substitution of the lever valve for the hand rope control introduced the use of the independent automatic stop, and then internal sleeves attached to the piston were introduced, and these, while otherwise the most perfect form of automatic, were found to have a tendency to score the cylinder and were abandoned for external stops, which became generally used on all types of hydraulic elevator.

About 1890 came the introduction of high pressure hydraulic systems, the pressure being 750 pounds. A number of plants of this character were installed in several of the larger buildings of that date. Among the more notable being as follows: The Supples block and The Bank of Commerce, St. Louis; the Brooklyn Sugar Refining Company, Brooklyn; the Girard Trust Company and the Loan & Trust Company, Philadelphia; the Metropolitan Life Insurance building, New York; the Prudential building, Newark, N. J.; the Oliver building, Pittsburg, and the Montgomery Ward building, Chicago.

The direct plunger elevator, one of the earliest hydraulic types, was introduced and gained considerable popularity during the past few years. While for comparatively low rises and moderate speeds it has given satisfaction and is a very good type of construction that appeals to many, it has not, under the more trying conditions of high rises and higher speeds, proved to be as efficient as the geared types. The plunger elevator has been found to be easily operated, efficient and economical, both as regards maintenance and repairs, but for structures of 200 feet and over in height they can hardly be said to be a success.

It may be of interest to many to know that in the early days of elevator construction, the use of a counterbalance was the exception rather than the rule. It cannot be assumed that the saving in power through its use was

not realized at that time by the manufacturer, but it is possible that it was omitted principally on account of the cost. It was not long, however, until certain arrangements of counterbalance for various types of machines became standard. The horizontal hydraulic machines are provided with independent or car counterweights only, these weights being enough lighter than the car to enable the latter to descend empty at a proper speed. The usual amount of excess weight, for an ordinary size car, is approximately 500 pounds. For large cars, and cases where there is considerable friction, the unbalanced weight may be 750 or 1,000 pounds. In general, these allowances have proved satisfactory for slow speed elevators. The vertical hydraulic machines are usually counterbalanced by weights in the cylinders and traveling sheave straps attached to the side of the moving parts of the machine. Ordinarily on installations where the cars are extremely heavy, independent car counterweights are provided. The car counterweight, however, in such cases is not particularly desirable on high speed installations, for it is liable to cause an unpleasant jumping of the car when making a landing at full speed. It has been found that a very satisfactory control can be obtained where the counterweight is all in the strap and cylinder, and it is well to have a considerable amount of cylinder weight.

It may also be interesting to know that during the four years preceding 1912 no hydraulic elevators were placed in any of the large office buildings in New York, which is conclusive evidence that the hydraulic elevator is surely passing out of existence.

As near as can be determined, the first direct application of electricity to elevator service was in 1887, when William Baxter of Jersey City designed and installed a direct connected machine at Baltimore, but it was not until 1889 that the first successful electric elevators were put into operation by the Otis Brothers Company, which installed two direct connected worm gear machines in the building of A. D. Demarest at 335 Fifth avenue, New York. These first machines and those built for a number of years after, were controlled by a hand cable. Through this beginning, conditions of operation and mechanism so rapidly changed and improved that soon electric elevators were not only used for express cars of heavy capacity in large commercial buildings, but for a wide range of service down to and including small passenger elevators for private dwellings. But none of these were able to meet the demands of high speed and the heights of travel desired for modern tower buildings until the introduction of the Otis electric traction machine, which was invented and installed in the Metropolitan, Singer and Woolworth buildings. In the Woolworth building the cars will travel a distance of six hundred and seventy-nine feet and six inches. The elevator equipment in the Metropolitan Life building, in New York, including the Metropolitan tower, is the largest elevator equipment in the world. This, however, is a varied one, being part electric and part hydraulic. For complete electric equipment, however, the Hudson Terminal building has the largest in the world.

There are many points in the design, operation and maintenance of the gearless traction elevator which are superior to those of the hydraulic type and caused their present almost exclusive use for tall buildings. A few of these points are: First—The small space required for the location of the machines. This feature makes available room which formerly had to be given up for the power plant, but which is now available for rentable area. Second—The maintenance cost over a period of years for the traction ele-

vator has been found, as computed by the Otis Elevator Company, to be less than for the hydraulic elevator. The rapidity with which the traction type of elevator may be accelerated or stopped has made possible a schedule and an elevator service for the taller buildings, which could not have been obtained with any type of hydraulic equipment.

As the new Woolworth building has, no doubt, the best equipment in the world, I will briefly describe same: The building is erected on Broadway and Park place and is 55 stories in height, or a total of 750 feet. It is the tallest office building in the world, and some idea of its size will be obtained when it is realized that it has a floor space of 27 acres. The main building is 29 stories high, and the tower, which occupies the center of the Broadway front, 26 stories.

All of the 26 elevators, with the exception of the shuttle tower elevator, are to be of the Otis gearless traction type. The shuttle elevator, which is to rise from the 51st to the 54th floors, is of the electric drum type. There is also to be provided an electric push button elevator, which is for the exclusive use of the Irving National Bank, occupying the basement and the first four floors of the building. In connection with the elevator equipment of this building, a new system of regulating the service and of dispatching the elevators has been introduced. An isolated dispatcher's station has been provided and by means of a series of miniature lamps the dispatcher is able to follow the progress of the elevators throughout the building. These miniature lamps are shown upon a board, in banks corresponding to the elevators, and a lamp is provided to designate each floor. As the car passes the floor a corresponding light shows in the dispatcher's room. The dispatcher's room is in connection with the operators, both by means of a starting signal and also through a telephone. This telephone is so arranged that the dispatcher may communicate and carry on a conversation with the operator, or it can be thrown over so that the dispatcher may give orders to the operator and the operator cannot reply to the dispatcher. The orders are transmitted in the car through a megaphone. Many of these features have been used in connection with previous installations, but the handling of the elevator has never been attempted in the above manner.

The speed of the high rise elevators for this building is 700 feet per minute. This speed had not previously been permitted by the building department of New York, but on account of the service required of this type of building, it was found necessary to increase the speed limit and this is the first electric equipment in the city which has been designed and installed for operating at 700 feet per minute. In some previous cases hydraulic elevators have been installed for these high speeds, but this was previous to the restrictions passed by the building department.

The term safety, as applied to elevator construction, refers to the various devices attached to the car frame or sling in which the car proper is carried, and designed to stop it in event of an accident to the lifting cables, or excessive speed from any cause. They may be located either above or below the car, though the latter is now usually the position, except in places where no pit room is available. This position is preferable as the car frame is subject to less strain when the safety is operated. The original "safeties" out of numerous experiments have proved the breaking of the cables. Only a few types of "safeties" out of numerous experiments have proven available and these have become standard. Those in use at the present time may be divided into two general classes: Those used with

wooden guides and those used with steel tees. Of the first class the gravity wedge is the oldest and was followed by the triple grip and the double grip. The Baldwin roll was the first used for steel tees. The toggle clamp was designed to meet the needs of increased speed and has been superceded by the wedge clamp. The wedge safety is the one now in general use on both hydraulic and electric machines where steel guides are used, being operated by a ball governor at the top of the hatchway and revolved by a small cable attached to the governor. These safeties may readily be equipped with emergency devices, by means of which the safety may be turned on by the operator, either by hand lever or hand wheel in the car, the hand wheel being the latest type. It does not necessarily depend upon the operator in case of danger, but should the speed for any occasion exceed the predetermined limit at which the governor is set, the latter trips and the clutches seize the governor rope, arresting it, and further movement of the car from this point pulls the governor rope through the governor sheave, producing a pull of several hundred pounds. This causes the safety jaws to maintain a powerful and steady grip on the rails, and they slide along, gradually becoming tighter until the car is brought to rest. The distance slid through, therefore, depends upon the total load on the safeties and the speed at which the car was moving when the governor tripped. It is this feature that makes this safety suitable for both heavy loads and high speeds. In addition to the above mentioned safeties, which depend largely on the speed of the car, there are a number of automatic devices so arranged as to slow down and finally bring the car to rest at the limit of travel either at the upper or lower landing. They are so perfect and positive in their operation that a great many operators rely on the automatic stops at the terminals. This is a very poor policy, and should be avoided as much as possible. Apparently the safeguards on the elevators of today are about all that could be asked for, but, no doubt, future developments will bring out other types far superior to those now in use.

The provision of elevators for a large building is an important problem for the owner and his engineers, as the conditions of traffic must be carefully studied. It is, of course, obvious that to make an office building, store or hotel successful, there must be adequate elevator service, so that tenants on the upper floors will be as well served as those below and an important factor is that no matter how high the building, rental conditions demand that the time from the ground floor to any floor does not exceed one minute. Therefore it is necessary in the case of a large building, where there are many tenants, to maintain local and express service, the latter not making any stops between the ground and some designated floor, such as the ninth or tenth floor. If the building is very high, express service for floors beyond the sixteenth or twentieth floor may be maintained by some of the cars, and in excessive cases to even a higher point. It was once believed that the number of elevators in the building should be based upon the number of square feet of rental area, but today the problem is more complex and elevator engineers have not only to figure on the number of floors and their area, but on the character of the tenancy. There must be enough cars to give ample service, both for the comfort and convenience of the tenants and for safety and economy. What is more, a regular schedule service must be maintained. It has been computed that the best service and greatest economy are secured where the number of cars are so proportioned that with the usual average traffic, stops should be made at $\frac{1}{4}$ of the number of

landings and that each car run with .4 of the maximum load, but conditions of operation are no less important than those of design. The success of the system depends upon the regular movement of the cars, and in many of the larger buildings traffic managers and engineers are in direct communication with each other.

The elevator operator's position is also one of constantly increasing importance, for the longer rise and higher speeds not only require greater skill in making the landings, but as the ingress and egress of passengers is the largest item of time consumed, this movement must be expedited as much as possible. The success of the system also depends upon the class of operators employed. Therefore, it is necessary to secure intelligent operators, placing them directly responsible to the traffic manager.

In addition to these, a great responsibility is placed on the engineer, whose duty it is to see the cars, safeties, and all appliances are kept in proper working condition, and it is absolutely necessary that the best possible man obtainable be employed for this position.

In the Old National Bank building, of Spokane, we have four of the gearless traction elevators and one combination freight and passenger elevator of the geared type being operated as follows:

Car No. 1 is put into service at 7:15 a. m., running continuously until 5:45 p. m., six days per week, being a local car, making any and all stops from first to ninth floors, a distance of 112 feet 4 inches, with an average of 16.18 miles per day.

Car No. 2 starts at 7:45 a. m., running continuously until 6 p. m., under the same conditions as No. 1, making an average of 16.64 miles per day.

Car No. 3 is in continuous service during the entire day of twenty-four hours, every day in the year, except a few minutes for cleaning and adjusting, running as express with no stops between the first and eighth floors, but local from the eighth to and including the fourteenth floor, a total of 174 feet 5 inches, from 8:15 a. m. to 5:15 p. m., the remainder of the twenty-four hours as local, serving all floors, making an average of 31.41 miles per day.

Car No. 4 starts at 7:45 a. m., continuous service until 6:15 p. m., as express from first to eighth floors, being local eighth to and including fourteenth floor, a total of 174 feet 5 inches, making an average daily mileage of 26.57. All cars—1, 2, 3 and 4—have a speed of 600 feet per minute.

Car No. 5 is used for both passenger and freight service and is in service twenty-four hours per day, except for cleaning and adjusting as necessary. It travels from sub-basement to fifteenth floor, 212 feet 10 inches at 400 feet speed, making a daily average of 18.57 miles. Therefore, we have a total daily travel of the five cars of 108.97 miles, handling 14,000 passengers daily, six days per week, and about 1,000 passengers on Sunday, with a total of 2,984.51 car miles for the month of June, 1912, at a power cost of 7.5 cents per mile.

A factor in the operation of elevators where power is transmitted by central station is the continuity of service. For instance: In Spokane we are able to derive power from four separate and distinct sources from as many power plants operated by the same company. Interruption of service with us is practically eliminated. This power is obtained from the Spokane river, which passes through the heart of the city. In its 120 miles of travel this river has a fall of 1,200 feet and in its course is utilized for power development at five separate places, namely: Post Falls, 20 miles distant, 25,000 horsepower; in the heart of Spokane, 10,000 horsepower (possibly

30,000 horsepower); Little Falls, 40 miles distant, 37,000 horsepower; Nine-mile, about nine miles distant, 10,000 horsepower. In addition to the foregoing, construction on a new power plant has been started at Long Lake, about 29 miles distant, which will have a fall of about 170 feet and is to put into service from this single station when completed in about two years the enormous energy of 70,000 horsepower. Thus we will have in service, on completion of this new plant, immediately tributary to Spokane, 182,000 horsepower.

The combined rate for light and power furnished our building by the Washington Water Power Company is .024 cents per kilowatt hour, a very low rate when considering that slack coal laid down in our bin runs on an average \$5.25 per ton.



Elevator Service, Signals and Accessories

By Henry C. Tulley

THE elevator service is a feature of the building which must be carefully looked after. There is nothing in the makeup of an office building, loft building or apartment house that has more to do with keeping it full of tenants than the elevator service.

While the structural and mechanical feature, as far as proportion and strength of materials is concerned, is well nigh perfect, the important function of operating the mechanism is entirely dependent on the judgment of the man in charge. If he is a careful, cool-headed man who always does the right thing at the right time, accidents will be few. Right here I want to impress on every manager to be careful in selecting elevator operators, and after he gets a good crew try and keep them.

It must be admitted that elevator operators, like other human beings, have their off days. The days when they have headaches and other slight illnesses which dull the senses and give birth to carelessness. So it is necessary to have a watch on them all the time to prevent them from becoming careless.

It is surprising how elevator service can be improved by judicious study. The first thing in the way of good elevator service is to get a good crew of operators, and if you have three or more elevators it is wise to have a starter. The next thing is to have them nicely uniformed and see that they keep them neat and clean. The operators are required at all times to present a neat and clean appearance. The care exercised in this regard causes them to have a military appearance that is attractive, and with their cheery greetings they seem to make a good impression on the tenants. There is one thing I impress on the operator when I employ him and that is, he must be considerate and polite to all, and, most of all, practice self-control.

I do not permit the operators to have chairs or a seat of any kind nor to smoke or talk to anyone only as far as to answer questions, that is, to tenants and those seeking tenants, and then in a gentlemanly way. I instruct the operator, in case of any accident, to report to the starter immediately and then to me, then forget about it and not to talk to tenants or anyone about it.

I find by closely watching a new operator that he tries to introduce some apparent gain of time upon the average conditions. But it must be pointed out that elements of danger are introduced where time is cut to premature opening and closing of gates and premature starting of cars. Such practice, indeed, often fails entirely of its purpose, being accompanied by much over-running and returning to landings, and unless all operators in a row of elevators are equal in the performance of their cars, the cars get out of schedule and such time as may be gained by one car is lost in waiting at the starting floor for the others.

It is not necessary to do more than refer in a general way to the wide variety of characteristics in that large proportion of the general business population which utilizes the convenience of elevators. Every temperament

and condition, all ages and both sexes, are included and upon the movement of the average of all, in and out of cars, depends the effectiveness of the elevator to a considerable degree.

The time occupied at each landing is dependent upon the co-operation of the operator and the passengers. The period which must be taken to represent average conditions is therefore not the minimum time which may be expected, but rather such as will afford reasonable time for deliberate action on the part of the average passenger.

The operation of a passenger elevator consists of a series of trips and rests in which the car travels from its starting or ground floor station to its upper or top floor station, with intervals of rest, returning in the same manner to the starting point, there being detained while the passengers who have been brought down make their exit and others take their place for a new ascent.

Each trip should be made in regular schedule time, that is, allow a certain time for each car to make a round trip. I have found by careful watching and timing the elevators, they will make in the Wainwright building, which is ten stories high, a round trip in two minutes per car. That gives us an elevator at the ground floor, one at the top floor, and a car going up and one coming down at the fifth floor. The time occupied by each round trip results from two elements. The ability and judgment of the operator, and consideration is equally required in this connection for the time consumed by the movement of the operators in opening and closing gates. The second and largest time element in the operation of the elevator is that in which the public is concerned. In the control of the car and the delay by ingress and egress of the passengers, it will be readily noticeable by any observer that the characteristics affecting the time occupied in movement makes the latter a variable quantity with the operator as well as with the passengers. Operators vary as to the time consumed, not only in the physical operation of gate stations, but in mental preparation for action, with the adjustment of action to distance, such as moving the power control in advance of a landing as well as in their alertness upon receipt of signals and their attention to passengers' requests. Such variations are reduced by training and experience. I have come to appreciate the loss resulting from overrunning and returning to landings and the dangers due to inexact landings. This important relation of elevator service to the success of all buildings renders it very desirable to determine the proper schedule. The schedule will be that which will result from the proportionate number of elevators divided into the average time consumed by each elevator. In my opinion an ideal method of running a bank of elevators is similar to that of running a system of trolley cars, that is, to send them away from the starting point under an exact schedule. The exact interval of starting varies, of course, in the different buildings.

Owners and managers of buildings should use every means possible to keep their elevators in first-class condition. Elevator accidents have ruined many good buildings. The safety of an elevator is seldom questioned by the people using it, as it is there to be used and one has the right to assume that it is safe. The public demand and are invited to use it, and its convenience is held out as an inducement for patronage, so it is up to the manager to see that his elevators are safe. The best way to have safe elevators is, first, to have a good engineer, and if you haven't a good engineer, get one,

and give him complete charge of elevators and operators and hold him responsible for the care of elevators and their safety. Impress upon his mind that the success of the building depends on good elevator service, and in order to give good service he should subject every part of the elevator to the most rigid examination every night. After this has been done every possible precaution should be exercised to avoid accidents. In my opinion the best way to get good service is to send for your engineer, question him and see if he has the qualifications for such a position. He should have a thorough knowledge of elevator construction and operating machinery, boilers, engines, electricity and pumps as well as the care and handling of men. After having a talk with your engineer and you have made upon your mind that he is the man you want, I would say, "Jim, I want to have a little confidential talk with you. Are you aware that there is an immense responsibility resting on both our shoulders? The lives of all persons who take passage in our elevators are intrusted to and are under our care, and we should discharge such trust faithfully and conscientiously by attending to everything pertaining to the elevators. The success of this building depends on good elevator service, and I am going to give you complete charge of all elevator machinery and operators and I will give you every aid possible, so it is up to you to be constantly on the job. It is necessary to look after every part of the mechanism every day; begin at the roof and go down to the basement, examine the cables; if there are any broken wires condemn them, take no chances. Don't try to get a few more weeks' wear out of them."

The life of the cables depends a great deal on the care given them. Cables last in the Wainwright building from three and a half to four years on hydraulic horizontal elevators, geared 12 to 1.

As it is the earnest wish of the management to make the service the best possible, the strict observance of these rules will greatly help to attain that end.

Rules for the Engineer.

1. Have the elevators ready to start at the appointed time.
2. See that all lights are lit.
3. See that the speed controller is in good condition.
4. See that automatic stops are in good condition.
5. Keep the cables well lubricated.
6. Allow no one to go under a car or work under one unless you have a brace or a bolt in the guides so the car cannot come down.
7. Examine the counter weight cables and guide strips and keep them well lubricated.
8. See that all doors and hatchways are in good order and that all doors lock.
9. See that all oil and grease cups are filled every morning.
10. See that every portion of the shifting apparatus is in good working order.
11. If electric machine, never work around them except when standing on a rubber mat.
12. See that there is no grounds on any part of the wiring or machine.
13. See that no one works in any part of the hatchways unless a man is put in charge of that elevator, and instruct him not to run the elevator

until the party gets out of the hatchway, or see that the elevator is shut down and cannot be started.

14. If the governor becomes out of order shut that car down until it is fixed.

15. If hydraulic elevators, watch every pipe leading to the sewer so you won't have water constantly running in the sewer.

16. See that no water leaks on the cables.

17. Watch the starting device, examine it every day. There is nothing that will scare a person quicker than to see the operator try to stop a car and find it won't stop because some little thing needs adjustment in connection with the starting device. A key might have dropped out of the seat. There are many things that need to be looked after every day. The same with the electric machine—it must be looked after every day.

18. Instruct the starter to test the automatic on each car every day, by having the car under a fair speed and let it stop on the automatic and report to the engineer if he finds anything wrong. This is very important and it is up to the engineer to see that it is done.

19. The starter should report to the engineer every night the working condition of each car.

20. See that the cars are always kept clean and all the brass work polished.

Rules for the Operators.

1. Don't allow your car to be overloaded.

2. Report all doors, door locks and anything in the hatchway that is out of order to the engineer.

3. See that doors are closed before starting your car.

4. Avoid overcrowding cars.

5. Keep passengers clear of gates and operating lever.

6. Uniforms are to be worn at all times when on duty.

7. Do not loiter around the lobby, entrance or stairways.

8. Personal neatness, cleanliness, courtesy and politeness will do much to improve the service.

9. Look out for peddlers, beggars and suspicious characters and report them to the starter.

If these rules are carried out, every manager or owner of a building will have peace of mind in regard to the safety of the elevators.

Lubricating of Elevator Guides and Other Bearings Around Elevators.

External lubrication is a very easy thing if the lubricant is applied to and evenly on the rubbing surface. The best thing, then, is to install an automatic lubricator. It lubricates the guides better and eliminates the danger and expense of doing the work by hand. It requires no attention beyond filling the cups about once a month. It effects a saving by doing automatically what was formerly done by hand. It does away with the dangerous method of swabbing the guides by hand. It keeps the hatchways clean and prevents the dropping of oil or grease into the car. With automatic lubrication the accumulation of grease and dirt is impossible. And anything that saves work and friction is a good thing to have.

Another good thing to have on an elevator is the illuminated threshold, as a great many accidents are due to passengers stumbling on the threshold

when entering the car. The illuminated threshold calls the attention of the passenger to the position of the elevator platform in relation to the floor landings by thoroughly illuminating them. The illumination of the threshold also serves as a warning to passengers not to stand too close to the car entrance; this prevents numerous accidents.

Elevators should be free from reading matter, mirrors or any other attraction that tends to direct a passenger's mind from the more serious business of the moment, viz., watching for his floor and getting off when it is reached. The theory is, it takes so slight a suggestion to start a person's mind to wandering and one is likely to come to just as the gate is closing, and the usual dive for the door when the car is starting has been known to result disastrously.

Another very important adjunct to economical and efficient service is the automatic starting device by means of which a bell is run at exact intervals to notify the elevator to start. Through this device it is possible to run the cars on an exact interval of headway.

Elevator Travel Recorder.—The combination travel and trip recorder gives two distinct readings: one, the actual number of feet of movement of the elevator in either direction, and the other reading the number of complete trips made.

With this information at hand it is possible to reduce the cost of elevator operation to a basis of car mile travel. Without the travel recorder it is impossible to say how much actual service has been returned by the power consumed.

On hydraulic elevators the readings of the travel recorder may be reduced to cubic feet or gallons of water used and the readings given by the recorder are considerably more accurate than those of a water meter.

By means of the combination of the readings of travel and complete trips made, it is also possible to check up each individual operator in that the recorder gives information by means of which can be told the exact number of feet each operator wastes in making inaccurate stops; thus, if the round trip of the elevator is 200 feet and at the end of the day the trip recorder showed 100 trips, this car should have traveled 20,000 feet; if, on the other hand, the travel recorder showed that the car actually traveled 22,500 feet, it has indicated that the operator wasted 2,500 feet of travel by making inaccurate stops.

Signals.—With the advent of the tall office building and higher speed elevators, the necessity of an efficient elevator signal was immediately felt. The speed of the elevator would have detracted rather than added to the efficiency of the service if there were no accurate means of signaling the operators.

As the buildings became larger and the number of elevators in one group increased, it became equally important to promptly advise the waiting passenger which elevator would arrive first so that he might have ample time in which to get to that particular hatchway to meet the elevator and thus avoid delay.

It soon became apparent, therefore, that the ideal Elevator Signal System for office buildings must include two basic features. It must notify the operator of the first approaching elevator to stop at the floor from which the passenger had signaled, giving this notice in plain, decisive manner without taking his attention from his duties; also it must tell the waiting passenger which of the cars would arrive first, giving this notice without burdening him with the necessity of studying a number of indicators.

In the Wainwright building I have the Armstrong System installed. It signals the operators to stop by the flash of one lamp, which he can see whether or not he is looking in its direction. Similarly this system signals a passenger by the flash of one lamp, which attracts his attention rather than calling upon him to look for it.

Aside from the fact that an elevator signal is a necessity if traffic is to be handled efficiently, the distinct economy it effects in operating expenses removes it from that class of equipment which merely adds to the service without saving money. The equipment of a bank of three elevators with the proper signal system gives considerably better results than you would be able to get without the system.

Unless an operator receives sufficient notice to stop he will naturally run past the floor a few feet, enough power will be wasted by the extra stop or reversal to run the car several feet. It is very apparent, therefore, that a signal which eliminates the unnecessary "stop" or reversal would soon pay for itself.

An observation under actual working conditions of the most economical type of electric elevators shows the following:

Starting current	190 amperes
Running current	30 amperes
Running current, per mile, no stops.....	1.25 K. W. H.
Running current, per mile, stops every three floors.....	5.25 K. W. H.

Stops consuming 75 percent of total current.

It was also found that the amount of power consumed in one stop would run the elevator 42 feet.

A complete electric signal system gives a positive indication to both the waiting passenger and the operator, before the car reaches the floor. It is only necessary for the passenger to push the up or down button as the case may be. This sets the signal so that the first car approaching automatically lights the up or down signal lantern above the elevator door. This signal is usually set to light when the car is within three floors of the waiting passenger, although the distance can be varied according to the speed of the elevator. When the car is within a distance of from one to one and a half floors from the passenger, the operator's signal in the car is illuminated, thus giving ample time in which to stop his car without running past the landing. The lamps in both the lantern and the car remain lighted until the car passes the floor from which the signal was given, when they are automatically extinguished. Should the first car receiving the signal be fully loaded the operator transfers the signal to the next car by pushing the transfer button in his car.

From the foregoing description it will be seen that the system is entirely automatic, allowing the operator the free use of his hands for the control of his car, thus adding to the safety of the passengers.

In connection with installations of more than two elevators, mechanical or other types of indicating devices where used alone are annoying and cause frequent unsuccessful trips to the various elevator doors. This annoyance is particularly noticeable when the cars run at high speed and on a limited schedule, as is required for good service in high office buildings.

The signal obviates these difficulties, as it only communicates with the nearest up or down car approaching the landing and the signal shows plainly

which of the cars is approaching. The passenger is thus prepared to step into the car as soon as the door is opened.

Furthermore, the operator being signaled is able to run at high speed between floors and is enabled to stop at any floor without loss of time, and without the strain on the machinery caused by quick reversals.

At each floor it is only necessary to have one plate. There are various styles of these plates.

On the elevator enclosure over each door is mounted an ornamental fixture having two globes. In each upper globe is a white incandescent lamp, which, when lit, indicates the upward movement of the car approaching the landing. Each lower globe contains a red lamp, which, when lighted, indicates the downward movement of the car approaching the landing. In a prominent position in the car and in view of the operator is mounted an ornamental fixture containing a ruby lamp, which, when lighted, indicates to the operator that the car is approaching a landing on which a passenger is waiting.

When mechanical indicators have been installed, or in small office buildings having from one to three elevators which run on a regular schedule, the cost of the signaling may be reduced by using the operator's signal only.

This system is the same as a complete signal except that no lamps for the waiting passengers are used. With the signal system it is not necessary to have mechanical indicators at each floor; but in buildings where three or more elevators are installed, mechanical indicators on the elevator inclosure at the ground floor are of great value, as they indicate to the starter the exact position of each car, and thus enable him to properly regulate the service. It is frequently desirable that the starter be able to signal any car after it has left the ground floor. For this purpose there is a device consisting of a set of push buttons, each connected with a buzzer in the respective cars.

The push buttons are mounted in an ornamental plate on the first floor and convenient to the starter, so that he starts the cars from the top or bottom or signals to the operator at any point. In connection with the signals and ground floor indicators this system insures perfect elevator service, as it places all the cars under the complete control of the starter. As previously noted, the value of a good signal system cannot be overestimated. Experience has shown that the installation of the signal system has in many cases helped a manager to fill his vacant offices and made a difference between a poor service and a highly satisfactory one to the tenants. It is a conservative claim that with signals it is possible to handle a given traffic with 15 percent less number of elevators than would be required if no signals are used. Signals are especially effective with high speed elevators, making possible great saving in cost of repairs to the plant, because quick reversals always made by operators when not signaled in advance are very hard on elevator machinery and are also a frequent cause of accidents. The avoidance of running past floors also effects a material saving in amount of power required to operate the elevator service, where electric elevators are used.

The economy guaranteed in the cost of power will in itself pay for the entire cost of signals within a limited period of time, depending upon the number of elevators and the frequency of the service. It is a conservative statement to say that perfection of complete signal system has made possible the economical and satisfactory operation of high-speed elevator service.

The principal advantages of signals can be summarized as follows:

1. Increased efficiency of the elevator plant, insuring satisfaction to the tenants and the building owner.

2. Saving in wear and tear on machinery. This has been proven many times by comparing the bills for repairs before and after the installation of the signal system.

3. Saving in cost of operation by reason of the reduction in the number of reversals due to stopping and starting after running past landings.

Express Service.—In applying an express service to a building of great height it is evident that the efficiency of that service as regards time occupied in travel may be arranged so as to affect beneficially the upper or more remote portion. Increase in height places the upper portion of a building at a disadvantage as regards access and the importance of adequate travel to that part becomes greater. Express service, therefore, comes into existence, in order to afford means of reaching the upper floors with the same opportunity as lower floors. Take, for instance, a building eighteen stories high in which service of elevators is established. The time occupied in carrying a passenger to and from the top floor is three minutes. The tenants on the lower floors would get in and out of their offices in much less time than the tenants on the upper floors, so we must give the same convenience and time to the upper floors. A schedule, or time interval, therefore, must be worked out and established, or, in other words, the same number of elevators must be provided for each section, so in order to give the upper floor tenants the same service we will have to give the upper floor tenants what is called express service. An express elevator is one where the first landing at which it stops is removed a number of floors above the ground floor. The distance from the ground floor must be worked out by the party in charge of the elevators. It is interesting to ascertain just where to divide the local from the express service. The first and natural suggestion is to effect the division at the ninth floor. By a division at the ninth floor you have practically equal service.

By adopting, therefore, that division you will nearly produce a balance in time service and these two sections of the building will receive an equal amount of convenience and the upper floors will be brought as near the ground as the lower floors.

The express service should be operated as a unit entirely separate from local service, with a relay of one local express.

With the exception of this one local express relay, cars should not run express today and local tomorrow, as this is confusing and impedes traffic. On floors where express cars do not stop it is a good plan to have the fronts closed, that is, partitioned, as nothing is more exasperating, if one is not familiar with the building, than to stand on a non-express floor and have cars pass you.

As there may be some managers here that have buildings with electric elevators that are not large enough to employ engineers and have had no experience themselves with electric elevators, will say a few words on the care of the electric machine.

Whenever the attendant wishes to handle the machine to clean, adjust, repair or oil it, he should see that the current is shut off at the switch, and thus prevent all possibility of accident.

Cleaning.—Keep the entire machine clean. Clean the commutator and other contacts and brush carefully with a clean cloth and keep them free from grease and dirt. If the face of the rheostat on which the rheostat arm

brushes work becomes burnt clean with a piece of fine sandpaper (No. 0), or if necessary use a fine file. Keep all contacts smooth. Try the rheostat arm when cleaning to be sure that it moves freely off contacts.

Oiling.—Oil the drum shaft bearings with good heavy oil. Oil the worm and gear by filling the chamber around them with a mixture of one part good cylinder and two parts of good castor oil. Keep this chamber filled to the top of the worm or mark on gauge glass, adding a little each day as it is used. The end thrust bearings are automatically oiled from this chamber. This should be drawn off every two or three months and replaced by fresh oil. Oil the motor bearings with dynamo oil. These are automatically oiled, but should occasionally be supplied with fresh oil. Lubricate the commutator, rheostat face, drum switch and contacts very sparingly with a clean cloth moistened with oil. Care should be taken not to supply too much oil to these parts. Keep the oil dash-pot, if any, sufficiently filled with oil to allow the rheostat arm to move quickly on the first contact and to retard this movement beyond this contact. The best oil for this purpose is fish oil, or some other thin oil that is not readily affected by changes in temperature. If an air dash-pot is used, keep it slightly oiled so as to keep the packing soft. Keep all parts of the elevator, including sheaves, cables, guides, etc., clean and well oiled.

Operating.—Before the current is switched to the machine be sure that the operating lever is in its central position. To ascend draw the lever the full throw to the up. To descend, draw the lever the full throw to the down. To run slow speed bring the lever toward the center according to the speed desired. To stop, bring lever to slow speed when within four feet of landing and to its central position when close to it. In this way the operator can make accurate stops. When starting machines on which the solenoid is used if the current is admitted too rapidly, thereby starting with a jerk, or momentarily dimming the lights on the circuit, check the speed with which the resistance is cut out of the armature circuit by slightly easing off the weight, which acts in opposition to the core of the small solenoid. The solenoid controls a valve in the dash-pot and thereby regulates its speed in proportion to the current passing.

If a governor starter is used and the current is admitted too rapidly, tighten the governor spring on the armature shaft, or close the vent in the air dash-pot. If the car refuses to ascend with a heavy load, immediately throw the lever to the center and reduce your load, as in all probability it is greater than the capacity of the elevator. If it refuses to ascend with a light load, throw the lever to the center and examine safeties, fusible strip and machine, and before starting be sure that the cables have not jumped from their right grooves. If the car refuses to move in either direction, throw the lever to the center and have the fusible strip examined. Never leave the car without throwing the lever to the center. If the car should be stalled between floors it can be raised or lowered by lifting the brake and running it by turning the brake wheel by hand.

Such a stoppage might be caused by the current being shut off at the station, undue friction in the machine, too heavy a load, fuses burnt out, or a bad contact of the switches, binding posts or electrical connections. If the car by any derangement of the switch cannot be stopped, let it make its full trip, as the automatic stop will take care of it at either end of travel. The bearings should be examined occasionally to insure no heating and proper lubrication.

General Directions.—Have the machine examined occasionally by some one well posted in electric motors and elevators. The attendant should inspect the machine often. All brushes and switches should be sufficiently tight to give good contact, but no tighter. None of the brushes should spark when in their normal position. When the brushes become burnt, dress with sandpaper or file, or if necessary replace with new ones. If brushes spark dress with sandpaper or file to a good bearing, and if necessary set up springs, but do not make the tension such as to interfere with their ready movement. Adjust commutator brushes gradually for least sparking. These should be close to the central position.

Contacts and brushes should be kept clean and smooth and lubricated sparingly. While replacing a fusible strip, be sure the main switch is open, and be careful not to touch the other wire with your tool or otherwise, as such contact would be dangerous. Never put in a larger fuse than the one burnt out. Inspect the worm and gear through the hand hole in the casing occasionally, to see that they are well lubricated and that no grit gets in the oil. They should show no wear. The stuffing box on the worm shaft should be only tight enough to keep the oil from leaking out of the worm chamber. Be sure that all parts are properly lubricated. To make sure that the car and machinery run freely, lift the brake lever and then rotate worm shaft by pulling on the brake wheel. The empty car should ascend without exertion. Keep operating cables properly adjusted. Open switch when elevator is not in service.

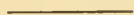
A Word on Elevator Installation.—The elevator in a modern building is a matter of great importance. By judicious selection of elevators those adequate to the traffic of the buildings are easy to install. This is a question for the purchaser to look into. My advice on this matter is:

1. To get the simplest in mechanical design.
2. The safest elevator made.
3. The most noiseless in operation.
4. The one controlled with ease and certainty.
5. The most economical elevator made.
6. The one possessing the highest mechanical efficiency.
7. The one easily and quickly adjusted.
8. The one that is massive and solid in construction.
9. The most durable elevator manufactured.
10. See that the grille work on the front of the shafts is made ornate without recourse to curves and angles. Simple straight lines with an absence of dust pockets can be made very ornate.
11. Do not have your gates, if hand operated, weigh more than 120 pounds, and if mechanically operated they should be as simple in construction as possible. The car gates should interlock with the floor gate, at the same time locking the car controller, so that the power cannot be put on while the gates are open. This may seem too fine a precaution of safety, but after watching the actions of some operators and an equally foolhardy public, one cannot help concluding that too many precautions cannot be taken. As to the car itself, the top should be so constructed that dust and dirt cannot drop through and ruin the clothes of the passengers. A solid flat top presents an excellent working platform for mechanics, cleaners, etc. The sides and rear of cars should be paneled to a height of about four feet to prevent to a great extent the poking of umbrellas and canes and the

throwing of paper, lighted matches, cigar stubs, etc., through the grille work. An interlocking tile either of cork or rubber composition makes one of the best elevator floors, being neat, sanitary and easily cleaned. The car should be broad rather than deep, having a wide opening for entrance and exit. The main floor gate should open to the full width of the car gate.



PART IX



Lighting

The Lighting Problem

By J. J. Forbrich

THE use of artificial light dates back to prehistoric times. It has been developed along with our civilization, and it, in turn, has been one of the most important civilizing agents man has ever devised.

The improvement of methods of artificial lighting has ever been a problem under consideration, and to this day there has been no greater interest to mankind than the artificial production of light—no branch of science or engineering that has had a more profound effect upon man's mode of life than lighting and illumination. To realize this we have only to consider what would be the effect on modern life if we had to give up all modern illumination and revert to the torch, the rushlight and the tallow dip of our forefathers.

At times great advances in the development of methods have been made, which form marking stones in the history of the art, and at times this development has lagged, and then again some discovery or invention has carried it rapidly a long way ahead. Thus, the old open wick lamp of the ancients was improved but little until Argand's invention of the burner which bears his name, and the use of this with a chimney. Other marking stones have been the introduction of sperm oil, afterwards to be replaced by petroleum, and that in turn by illuminating gas, and later the use of electricity in its various forms, which, for convenience, may include acetylene, this being, in a sense, a secondary use of electrical energy.

The rise of illumination to a well defined art is a thing of recent years. It is, in fact, linked with the later development of electric lighting in a way that in part, at least, accounts for the popular error of considering illuminating engineering as a branch of electrical engineering.

Among the electrical appliances also there are stepping stones marking the progress of the art. Thus, first comes the invention of the arc lamp; next the invention of the incandescent conductor, to be followed by the incandescent non-conductor and the incandescent vapor. Illuminants of all these various types are in use today.

The modern science of supplying light has added four to six hours to the average day, thereby lengthening the allotted span of life by from thirty to fifty percent, for light is life and darkness means sleep or death.

To the average person good illumination means great brilliancy, but the fundamental principle of good artificial illumination is the proper distribution of light, keeping the illumination of objects as strong as necessary for their intended use, and at the same time keeping the brilliancy or intensity of the light as low as possible.

By intensity is meant the volume of light coming from each square inch of surface on the light-giving source, which, in electric lights, is the filament. A diffusing globe put about the lamp has the effect of increasing the area of the radiating surface for the same amount of light, or, as it were, spreading the light out over more surface with less intensity at any point than the original area or filament had. The amount of light lost in passing through

this glass is so small that the total amount obtained is but little less than that from the bare lamp.

The subject of lighting cannot be separated from that of the human eye. It is a commonly known fact that the physiological effect of intense or over-brilliant light on the eye is very harmful; that it is about equally harmful to strain the eyes constantly to do close work in a dim light, or to do the same work in a constantly changing, uneven light. We know that while we see best by the light of the sun, we cannot endure the direct rays of the sun in our eyes.

Try to read a paper near an unshaded forty watt lamp hung low. To see the paper, some of the light must be reflected from it to the eye, and so it is, and if the eye were free to adjust the opening of the pupil to the intensity of that reflected light alone, it would see the paper clearly, but the direct rays of the light also enter the eye, causing the pupil to contract to such an extent as to prevent sufficient light reflected from the paper entering the eye. We have then the painful and harmful effect of straining the eye to see and at the same time suffering a forcible contraction of the pupil from too great a light. And because one does not see clearly and comfortably, he is sometimes led to believe that the light is insufficient.

If the lamp be raised high enough to prevent the direct rays from entering the eye, the pupil can adjust itself more to the light reflected from the paper. Then if a suitable globe be put over the light its intensity is decreased without materially lessening the total amount of light, and if the globe be tulip or bell shaped, much of the light is reflected downward, so that about the same amount of light is thrown on the paper, and at the same time the eyes are protected from the direct rays of the light.

On these principles all efforts in illumination should be based on protecting the eye from the direct rays of light, and so diffusing that light as to make it less intense in any one spot without materially lessening the total amount of light, and to have the light so situated as to supply a sufficient amount wherever needed. These results are obtained only by the most careful placing of lights and the use of proper shades and globes.

In the selection of shades and globes, their design and construction are of primary importance, rather than their ornamental effect, and such should be selected as will throw the light where desired or will decrease its intensity by diffusing it through suitable glass, or that will combine both these purposes.

Shades and globes made from clear, transparent glass, similar to the Holophane globes, are considered by many to be the best. The inner surfaces of these are corrugated or formed in prisms which are to diffuse and soften the light. The corrugations on the outer surfaces are intended to deflect these diffused rays into the desired directions. The material in these being clear and transparent, the loss of light by absorption is very small, while the corrugations or prisms accomplish the desired diffusion and deflection of the intense light.

There are three general classes in which these glasses are designed, according to results desired. One of these throws the strongest illumination desired downward, another throws it in all directions below the horizontal, while the third throws the strongest illumination slightly below the horizontal, or, in fact, the light can be thrown in any desired direction by using a globe properly shaped for the purpose.

Opal, opaline and ground glass globes and shades give well diffused light,

but there is considerable loss of light by absorption, and more inconvenience experienced in keeping the ground glass globes clean. Ordinary plain glass shades decorated with fancy designs are of but little value beyond their decorative qualities, because they change the distribution of light to such a slight extent.

Reflectors of opaque metal and silvered glass most thoroughly deflect the light in any desired direction, but they allow of no diffusion and leave part of the room in darkness while an intense light is thrown in another part, which causes the eyes, looking from place to place in the room, to continually contract and dilate to such an extent as to fatigue them greatly.

Every manager knows the dollars and cents value of good office lighting. The problem is simply, how can we get the best light at the least cost? The answer must be given in these words: Utilize all of the light you have, not wasting any of it. Prismatic globes and reflectors will not make light, but they will save the light you are now wasting. Take an ordinary incandescent lamp for example: This lamp does not give light equally in all directions, but, to the contrary, throws its greatest candle power straight sideways, and diminishes in all other directions. The sixteen candle power lamp gives sixteen candle power sideways, but only eight candle power straight downward, and between eight and sixteen candle power at the various angles, so if in your office you hang a bare lamp straight pendant about two-thirds of the light goes up toward the ceiling and to the side walls, and only a small percentage of it goes downward to illuminate your desks. In other words, you are wasting from one-half to two-thirds of the light you are paying for when you do not combine the proper lamp with the proper reflector or shade. In order to get the highest efficiency in lighting it is necessary to direct and distribute the light exactly where it is wanted and in the proper amounts.

A very good illustration to fix in the mind the idea of light control is that of the nozzle on a hose; the water in the hose may be compared to the light coming from the lamp and the nozzle to the reflector. You can get either a strong stream or a thin spray that covers a wide area, or anything between these two extremes. There are many kinds of reflectors to be had, but, to my mind, the prismatic or corrugated mirror reflectors, such as are used extensively in direct and indirect lighting, best control the light. Prismatic reflectors are made up of a large number of optical prisms, mathematically and scientifically designed, and made with much the same care as the lens of an optical instrument, and of a special optical glass. Each of these prisms directs the light rays. Variations in the design and contour of these prisms give the variations in light distribution. In this line, as well as in most others, however, there are worthless imitations.

The latest and best method of office lighting is to have sufficient light by general illumination to do away with the individual desk lamp, which can be accomplished by either the direct or the indirect lighting system. This not only saves considerable in first cost of wiring and fixtures, but does away with the blowing of fuses occasioned by loose connections and would-be electricians trying to fix them.

The first thing to do in making an installation is to ascertain the candle power needed, and then the number of outlets to use. This may vary from one in the middle of the ceiling of a small, square room, or one row of lamps in a long, narrow room, to a large number of smaller lamps equally distributed on the ceiling in order to supply uniform light on the working surfaces of the office.

How to Plan Your Arrangements of Light.

1.—In narrow rooms, where it is planned to use a single line of units placed down the middle of the room, the lights should be equipped with extensive type prismatic reflectors, placing the units about two-fifths to one-half times as high above the desks as the width of the room. These lamps should be placed about twice as far apart as their height above the desks.

2.—In large rooms with unusually high ceilings, use the focusing type prismatic reflector, dividing the space as nearly as possible into squares, as described later, and placing one unit in the center of each square, with a height above the desks of about one and one-third times their distance apart.

3.—In large rooms with ordinary ceiling heights, or narrow rooms in which it is intended to use two rows or more of light, the use of the intensive type prismatic reflector will be found most efficient, placing the units about four-fifths of their distance apart over the desks.

4.—Where architectural interference is encountered, making it impossible to follow rule 3, the height of the units above the desks may vary from two-thirds to one time their distance apart in either direction, and this without materially affecting the uniformity of the illumination.

5.—Where we find the outlet already located, and too far apart to apply rule 3, or when it is found impractical to supply as many outlets as required, use extensive type prismatic reflectors, making the height of the units above the desks or working places one-half their distance apart.

Now as to size of lamps and reflectors: where the walls, ceilings and woodwork are of a light color, allow about eighty watts for each 100 square feet of surface to be illuminated. But if the colors are dark, allow 100 to 125 watts for each 100 square feet of surface to be illuminated. Now divide the number of watts as determined by the number of outlets and the resultant figure is the number of watts required at each outlet. We may use one lamp, or a fixture with several lamps, as may be preferred, as the distribution of a single unit or a group of its component units will be found the same, provided that the lamps and reflectors are hung straight pendant and not at an angle. These figures on wattage apply only to Tungsten lamps.

If lamps of lower efficiency are used, the wattage and consequently the cost of current, will be greater. For small rooms the forty and sixty watt sizes will be found the best, and for larger rooms the sixty and one hundred watt sizes. If these rules are followed a very complete installation will be obtained.

Lamps Needed for a Given Space.

The watts necessary for a given candle power in a room may be accurately ascertained. For general office work an intensity of three to six foot candles is desirable, and taking this as a basis to figure from, it is an easy matter to ascertain the number of lamps needed for a given room or space.

One of the best plans to follow when arranging for lighting an office is to divide the ceiling into squares, and then put one lamp in the center of each square and not in the corners, which is a very common error, as this does not give sufficient light to the desks that may be close to the side walls.

In practical lighting problems, however, the spacing of the ceiling, the location and the height of the lamps as well, are very often dictated by the construction of the building, in which cases the lamp centers must be placed with careful regard for architectural conditions and for points where special illumination is desired, if there are such points.

In general, intensity of a desirable uniformity can be secured by proper spacing and use of lamps of proper candle power size for a given height of hanging. In continued clerical work it is essential that the light be carefully diffused and that the lamps be distributed so that each desk may obtain an equal illumination without shadows, and sufficient to do away entirely with the desk lamp.

Shadow, however, is not to be condemned altogether, since it has its usefulness, the eye depending on shadows and contrasts to bring out the contour and details of the object, but it may be very objectionable, depending on its density and location, lowering in a general way the efficiency of the illumination. Shadows may be practically obviated, however, by dividing the same volume of light into a greater number of outlets properly located, and by thus multiplying the low cost low candle power units greater economy is being practiced than by multiplying the high cost high candle power units to obtain the same freedom from shadows.

Fixtures to be used are immaterial, but should be in keeping with the general architectural scheme. The illumination does not depend on the fixtures but on the placement of lamps and reflectors, making sure that they are hung in a correct position and equipped with proper size and type of tungsten lamps and reflectors.

The installation of "indirect lighting" for general office use has made considerable headway during the last two years, it being claimed for this system that its light is the nearest to daylight of all systems on account of using the ceilings as reflectors, and thus obtaining a large reflecting area.

The ceiling should be either a light cream or an ivory tint, or if it is to be painted, a flat finish paint should be used, one having no oil in suspension, and giving a flat tone to the finish. Glossy surfaces are objectionable for indirect lighting. The walls should be of some medium light tint, in one of the lighter shades of buff, brown or green. Retinting should be done every one and a half or two years, depending upon local conditions.

The greatest saving by installing indirect lighting fixtures is in the original wiring of the building. For instance, in place of having the usual chandelier fixtures, wall receptacles and drop lights, all outlets and connections for desk lamps and drop lights are eliminated from the original contract.

It takes less time, also, to keep the reflectors of the indirect lighting system clean than the larger number of smaller types, there being but one side of the reflector to be wiped clean, and on account of its highly polished surface, it can be wiped with a soft, dry cloth without removing the reflector from the fixture. This is impossible with direct lighting fixtures, which must be removed and cleaned with water.

In order to be able to accommodate tenants who may prefer either the direct or the indirect lighting system, all center chandeliers can be constructed with the sockets pointing in a vertical position either toward the floor or ceiling. When this has been done, "adaptables" can be purchased, which are inexpensive and can be conveniently attached to the socket to convert the direct lighting fixtures into direct fixtures with little expense.

Indirect lighting, when installed upon engineering lines, takes no more current than direct lighting systems where the usual center fixture and desk lamps are used.

Indirect illumination is suitable for lobbies and halls of office buildings, theaters and hotels. This system particularly brings out the architectural features and decorations and entirely conceals the light source.

PART X



Insurance

Fire Insurance as It Relates to Buildings

By Charles E. Doty

Chairman 1910-11 of the Fire Insurance Committee of the National Association of Building Owners and Managers

IN order that we may realize the frailty of its inception, and the slow but sure progress of evolution, let us first look to a synopsis of the history of fire insurance.

The great fire of London in 1666 showed the necessity of fire insurance. So great was the damage wrought, that in ten years all the buildings had not been replaced.

Following other numerous plans, a company called the Hand-in-Hand was organized prior to the year 1700. This is considered the first fire insurance company—its emblem being two clasped hands. In 1720 the Royal Exchange and the London Assurance were organized and these are still in existence.

After several individuals had taken risks, merely promising to pay in case of loss, the city of Philadelphia took the first definite steps toward protecting property by organizing a voluntary fire department.

By 1752 they had seven fire extinguishing companies; and in that year the Philadelphia Contributionship—the first fire insurance company in America—was organized.

Twenty-nine years later the directors of this company decided that trees around a house retarded the companies fighting the fire. Friction developed because of this, and out of it came the Mutual Assurance Co. Both of these companies are still in existence, and continue their operations on the same lines—perpetual insurance. Defined, perpetual insurance is a deposit of a certain percentage of the face of the policy which is paid once for all, the interest on it proving sufficient to provide for the losses sustained.

The Revolutionary War exhausted the resources of the colonies, and Connecticut, because of its manufactories, seemed first to recover, and to this is attributed the organization at that time of many insurance companies within its borders. It is a matter of record that stock subscriptions were paid for, five percent in cash, five percent in thirty days, and 90 percent in notes and mortgages.

The early insurance companies around the first part of the nineteenth century were nearly all marine companies, and the depression in commerce, due to the War of 1812, wiped out most of them. The survivors saved themselves by changing into fire insurance companies.

In 1810 the Hartford Fire was organized. The officers received no salaries. They had only two agencies and they showed no system in locating them. One was at Canandaigua, N. Y., and the other at Middlebury, Vt. In 1820 an agency was established at Cleveland. Evidently it was apparent to the directors of the Hartford away back 90 years ago that Cleveland would always be larger than Pittsburg.

These were the days of pioneering. Tables of classified risks were unthought of. Of course, there had been no experts developed to pass on

the risks. There were no maps, and there was no state supervision to protect the policy holder. The directors passed on all questions to the minutest details—the vital portions of each policy with the survey, were read to the board before the policies were delivered.

The great fire of 1835 in New York wiped out scores of companies. The Aetna's losses were \$115,000—more than their resources, but the directors pledged their support and they paid accepted claims in full. This proved a good advertisement for them, for their premium receipts increased so rapidly that in twelve months they had as much cash as before the fire.

And such has been the record of the companies to weather the gales of the Chicago, Boston, Baltimore, San Francisco, and other conflagrations. The survivors have apparently unlimited resources.

At this time, Edwin G. Ripley, of the Aetna, was asked if they made money on paper mills, among which there was a frequency of fires. Ripley was aroused by the question and started the classification of risks, but independent of, and years in advance of competitors.

Then started the mutuals. One trying to do a general business, but failed; and the other, the factory mutual, based upon knowledge, improvement and inspection—not doing a general business—which has succeeded.

Then in succession has come the Standard form; daily reports, which facilitate the work and scope of the agents; the enlarging of the field of special agents, from agency establishers to adjusters of losses, and choosers of risks; and the stepping in of the State in reference to proper protection to policy holders, requiring resources to substantiate the companies' promise to pay in case of loss.

In 1880 Massachusetts first required the standard form policy, and other states rapidly followed. And such, in part, shows the growth of fire insurance, born of necessity, and as an authority has said:

"The evolution has been fragmentary, it is true, and not altogether in an orderly manner, but it has been a steady evolution nevertheless. Starting in ignorance of method, only having an object in view, the business of fire insurance has gradually reached out, and has more and more found a sure footing. The managers have noted where the relations of the business demanded changes; conflagrations have brought home to them certain truths; and when a form of organization or a method of doing business has broken down, men have been found to come forward and try something new, generally an advance over that which had been discarded. These men soon realized that the sole business of fire insurance was not simply to pay losses. The evolution has naturally been gradual up to the point where the skilled and capable underwriter recognizes that his business, being a part of public progress, should subserve the public interest best by preventing fires. Therefore he has made concessions in rates for the men who will take the extra precautions in the line of building and fire prevention. His horizon has broadened and he sees that fire fighting and construction are closely related in the prosperity of his business. He has learned, but slowly, it is true, but nevertheless he has learned that what the public desires above everything else is certainty, and while he has grumbled many times at the intervention of the state in his business, today he recognizes that intervention, as a rule, makes for the certainty which both he and the assured desires. There are many incidents and events in the century and a half of fire insurance in this country which might have been wisely different, but taken as a whole it has

been a sound and progressive development, comparing favorably with that of any other line of business."

The buildings which we here today represent are actually valued at from \$500,000 to \$1,500,000 each; some less, and some even many times more. Situated as they are in the most congested sections of our cities, they are subject more or less to damage by fire; especially is this true in case of a great conflagration. Although the owners have spared no expense and the architects and engineers have spared no ingenuity to give us buildings as nearly proof against fire as is possible, yet there are none of us who think our property cannot be destroyed.

Are we justified in carrying our own insurance, or should we, upon payment of a stipulated sum, transfer our liability to an insurance company?

The majority of our buildings are compelled to carry insurance, and with their owners there is no alternative.

A large building worth \$750,000 to \$1,000,000, situated in the very heart of the most congested center of one of our largest cities, went along for a number of years without insurance. One of the owners died, and the administrators feeling obligated to the estate, required fire insurance on the building. It costs \$110 per month. There have been no losses either with or without the insurance.

In another city a building worth \$750,000, owned by an individual, set aside each year \$5,000 towards a fire insurance fund. In eight years there have been no losses, and in the latter case also the owner died, and the administrator, too, now requires insurance.

An extremely large percentage of our buildings are erected partially with borrowed money. The insurance companies, banks, individuals, or others who make the loans, require that a sufficient amount of insurance be carried to protect the amount of the loans. Such, too, are the requirements when building on leased ground. The lessor requires sufficient insurance be carried so that any possible damage to the building may be repaired and the tenancy continued without the possible loss to the lessor in rentals.

We have here illustrations of the individual and independent owner, either willfully or neglectfully carrying his own insurance, and instances of owners, because of their financial obligations, compelled to be fully protected, and the latter are in the majority by a large percentage.

Why shouldn't everyone be insured?

Within the last few years the National Association of Credit Men, composed of from 8,000 to 10,000 members, and among them representatives of our greatest and largest corporations, have become alive to the necessity of fire insurance. The individual credit men are being educated to ascertain whether their customers are protected in case of loss by fire. Who would want to be the one who sold goods to the merchant who was without insurance when his establishment burned, and the last bill of goods unpaid,

Because our buildings are erected on mother earth, and built of stone, brick, cement, steel, and in many instances managed by brains—what would be the loss in case of a conflagration? What is the possibility of loss, even on one floor, from fire started on the premises?

And, as one of the bulletins of the Credit Men says, "Insure, and do it now—otherwise your assets today may be cinders tomorrow."

When a member of your family is ill, you want as good a physician as your money will employ. When you are desperately in need of a good lawyer you want as good an attorney as you can get. When you place your fire

insurance, use the same rule—employ the best and most reliable agency, or there will be breakers ahead for you.

In large cities competition is so keen among insurance men, they realize, or at least ought to realize, that rates being equal, their ability to secure and hold your business is in their ability to give the best insurance obtainable. They can assist you in drawing up special clauses, which apply to your particular needs, that will make you amply secure in case of a fire. Then, too, they can assist in a quick and equitable adjustment of your loss.

The history of fire insurance covers to the present time a period of 244 years, and it is the results of this experience that an agent ought to offer to his clients.

The nature of his calling does not necessarily make the building manager an insurance expert, and it behooves him to soak in a little of the other's experience whenever the opportunity affords.

As an illustration of the little things that can happen to annul the intent of your insurance, and of the necessity of closely reading the conditions of your policy, and also of having your insurance with a good, live agent, let me cite this instance that occurred to one of my tenants a few years ago:

This tenant had space on the third floor, and in the basement, and supposed that their insurance agent had them properly protected. They claim he was aware of the two different locations. They had a fire in the basement and the loss was \$2,000. The loss was properly adjusted and the amount agreed upon when it was discovered the insurance covered the stock only on the third floor. The insurance companies would not pay a cent of the loss and the tenant accepted their ultimatum as final.

I recently found a case parallel to the one just mentioned, in which the insured did not accept the decree of the insurance company as final, but sued, and his claim was sustained by the court.

A man who took out insurance on goods on the first floor of a building afterward moved the goods from the first to the third floor. A fire destroyed the property. The company refused to pay, on the ground that the location had been changed, and that the policy was thereby invalidated. This contention was not maintained in the courts, but it might have been if the evidence had tended to show the goods could have been saved if they had still been on the first floor. In other words, if the fire had started at the top of the building instead of in the basement, the insured might not have been able to recover his loss.

Which are the best insurance companies?

In a recent issue of the directory I found the names of some 175 to 180 insurance companies represented in the city of Cleveland.

The insurance on the building that I manage, is placed in twenty-one different companies, so it is easily seen that I can have my choice—and well I may.

In the past fifty years, 1,000 insurance companies have failed. Do you know the name of the company that paid \$4,000,000 in losses in the San Francisco fire, and still plods along writing policies and paying its new losses without outside help? Do you know the names of any of the companies that paid their losses in this conflagration without a whimper and their assets are still in excess of their liabilities? These are the companies to which to tie for it is their past records and not future promises in which we are vitally interested.

Investigate your companies as carefully as you would your own tenants. Learn their net surplus above capital and all other liabilities.

There are several ways in which to learn definitely about their financial responsibilities. Your State Superintendent of Insurance, located at each state capital, is a source of information as to companies operating within his state. An application to the loan department of any life insurance company will bring a list of companies acceptable to them. Surely they ought to have an unbiased list. But you may find it a long one, and a careful scrutiny of the names as to their size can further satisfy you as to their fitness to meet your requirements.

Your agent and your companies determined, you **MUST** give your most careful attention to the policy.

A fire insurance policy has been defined as "a contract to indemnify the holder thereof for actual destruction, by fire, of value appertaining to certain specified property owned by him."

Marine insurance is written for the actual value of the stock insured at the time the policy is written. But losses by fires, as our definition indicates, are settled on the basis of the actual value at the time of the fire.

In case of a partial loss to your building, have you the records on which to secure an equitable adjustment to yourself?

Personally, I believe that each building should be most carefully appraised, floor by floor, by an accepted appraisal company. When adjusting a loss, this will show actual value at a certain date, a percentage can be agreed upon for determination, and with it you can dictate the settlement and not the adjuster.

In a book entitled "Fire Insurance in Mills," and published in 1882, I found this paragraph:

"Competition among underwriters has reduced the cost of insuring manufacturing property to the lowest practicable approach to the actual risk involved; and the expense of insurance cannot be lessened in any other manner than by diminishing the hazards of fire."

That may have sounded all right in 1882, and I believe it did; but in the time present it is the farthest from fact.

I know of no combination of business interests as closely interwoven as the fire insurance companies. On the 9th of June, 1910, in the Indianapolis News, Attorney-General Bingham, of Indiana, was quoted as saying that if, through his suit against 129 fire insurance companies, he could break up the fire insurance combine, it would open up the fire insurance in business in Indianapolis on a fair competitive basis, which would produce fair profits for the insurance companies and at the same time reduce the cost to the insured.

Combination or no combination—if we are being given an equitable and fair rate we are not justified in wasting our time in protest. But if, on the other hand, upon us is levied a tax—for insurance is a tax—in excess of what our losses should bear, then we, as building managers, are negligent if we do not demand our fair rate and fight for it until the "cows come home."

Although the history of fire insurance dates back 169 years before, yet the classification of risks was unthought of until the year 1835. And today that classification of risks does us little good unless we actually make use of it.

In each and every city of sufficient size, the fire insurance companies (or at least those in the combine) maintain what is called an inspection

bureau, and this, I believe, is a part of the state inspection bureau. The word "inspection," however, is a misnomer, for the object of its work is the making of rates.

Nearly four years ago I was notified that owing to certain defects in wiring, negligence of tenants and several other items, the rate on our building had been increased about a hundred fold. And the tenants were told they were soaked, too. I immediately took the matter up with the manager of the inspection bureau, and promised him all of his recommendations would be complied with, both by ourselves and by our tenants, who would be evicted unless they did comply. After a systematic effort the work was all completed, and then I applied for our former rating. Did I get it? Pointing to a long picture hanging on the wall, he said: "Do you see that?" Looking at a photo of the Baltimore fire, I said, "Yes." And then pointing to a picture on another wall he said: "Do you see that?" And looking at a photo of the results of the San Francisco disaster, I again replied, "Yes." Then he said: "Someone has got to pay for that," and the rate that we had for six years, and upon which the insurance companies had enjoyed nearly 100 percent clear profit, was boosted because some one, or the system employed, had blundered.

Do the stockholders pay for their mistakes? No! And if fire insurance agents reflect the opinions of the stockholders, they don't admit of any mistakes.

To a well versed insurance agent I recently remarked that there are but few fires which could not have been prevented by due foresight on the part of some one.

"Could the Baltimore fire have been prevented?" he asked.

"Not now," I replied; "but it could have been prevented."

My apparent narrow one-sidedness appalled him, and he said that he could readily see I knew nothing about fire insurance.

Concerning the prevention of fire and the Baltimore fire in particular, let me quote one who hits the nail on the head after my own heart:

"Every underwriter knows that science long ago gave us automatic devices, unfailing in action, whereby a flood of water automatically plays upon a fire breaking out anywhere in a building, effectually preventing its spread and often extinguishing the flames. These devices are so cheap that equipment companies will install them free of extra cost to the insured. Were the owners of warehouses and stocks in Baltimore, where values under single roofs ran into a million dollars without being thus protected, refused insurance because of obvious negligence so inexcusable as to be criminal in its shortsightedness? Not at all. Was this wholesale district, peppered with dozens of instances of such foolhardy recklessness, placed under a ban, compelled by utter inability to procure insurance, to install automatic fire extinguishing appliances? Not at all. No more than they are in dozens of cities that can be named. Due notice, followed in the event of general apathy by one emphatic "No insurance to offer" all along the line, could have compelled Baltimore, inside of a year, to make itself immune against sweeping conflagrations. The refusal to accept the local premiums for a year would have saved the companies and the public \$30,000,000 in indemnity, and would have meant as a reward for a year's abstinence, a profitable business for years after the ban had been removed."

"It will be urged that such joint action could only be reached as the result of conspiracy, punishable at law. By what process, forsooth, do a

hundred fire offices in a city so stifle competition that their uniform charge for insuring certain merchandise lying in a particular building is, say, \$1.7639 per \$100—the price not varying half a cent, though you rap at the doors of the hundred underwriters? By conspiracy, of course. And conspiracy, for obvious public benefit, could not be more reprehensible than for covert public pillage. But the more dangerous the conditions, the higher the premium; the higher the premium, the greater the commission, and the greater the scramble among the agents to induce their home offices to issue dangerous policies. Apart from adequate inspection, moral and physical, and the conflagration cure, is there anyone competent to speak who believes that the losses due to isolated fires could not be materially reduced by heroic remedies applied after a fire for the purpose of preventing recurrences. For instance, fires happen every year, in 500 schoolhouses, 600 churches, and 1,400 hotels, and yet the conditions which produce these fires are being perpetuated. Why? In the greatest measure, because the fire insurance companies contemplate such visitations with imperturbable equanimity! The losses come out of the pockets of those who do not burn down. All that the brokers' principals do is to see that enough people with property relatively immune against fire, pay into the pool enough money to refund the losses of those sure money-losers who bribe heavily for admission to the same pool."

Yet, after all is said and done regarding the administration, it is the system of insurance that, in the main, is defective. Born long ago under conditions to which it was then far better adapted, it has withstood the commercial revolution, the industrial upheavals, and, as a whole, has stood unchanged, stubborn and unbending, while the whole business world about it was being transformed. Unless the ferment within is already at work producing changes not yet visible outwardly, it looks as if the revolution in insurance methods will have to be wrought through external agencies. Present conditions cannot continue long after the business man realizes that the figures in his insurance bills cover mostly disbursements for criminal negligence and apathy, greed, incendiarism, and a thousand preventable causes of fire and conflagration, and while the genuinely unavoidable cost of fire could be covered for a tithe of what he now pays. The whole business community is wretchedly served and badly abused in its confidence; it should work out its own salvation and not wait to have it worked out by others. There is, furthermore, a large section of this same community that should seek special relief because it can get special relief from this evergrowing burden and abuse; it is that section which, besides being sound and upright, financially and morally, has its property in such a condition that the probability of fire is much below the average—the class of insurers who do not burn down and who, under existing conditions, pay for the losses of those who can afford to burn down, who do burn down—in fact, pay the whole insurance bill of \$200,000,000 or more a year. It is that class of hotels, of newspaper plants, of furniture houses, of breweries, of clothing makers, of hardware dealers, with the excellent record, who today are charged a "basic rate" by grouping them with those who have the bad record and will continue to have fire.

And wherein lies the remedy?

Mr. George H. Holt, to whom I propounded the question: "Will it be necessary to organize an office building mutual?" writes: "While I think it will be unnecessary to form a mutual company to write office buildings alone, yet there is no doubt in the world that such an institution would be highly

profitable. When the New England Factory Mutuals can pay their losses and operating expenses at a cost of six or eight cents on a hundred dollars, writing hazardous risks throughout the country, it is absurd that fireproof office buildings should be required to pay the premiums which are exacted in most cities."

It is an actual fact that in 1909 the average net cost of all insurance of the New England Factory Mutuals was but $4\frac{1}{2}$ per \$100.

How many times $4\frac{1}{2}$ cents are office building rates? In Chicago, I am told, the insurance companies have a stop rate of 15 cents, but that the rate is nearer 40 cents than 15.

In the record of the Liverpool and London and Globe Insurance Company in 1909, in the Illinois classification report, may be found this vital information: With a premium income of \$550,000 and an aggregate amount of risks of \$44,000,000, the ratio of losses paid to premiums received was 42.3 percent on dwellings and their contents; 70.82 percent on mercantile risks; 42.91 percent on special hazards, and 11.45 percent on all other risks. There is no other classification in which office buildings could be placed in this schedule, excepting the very cream, "all other risks." The loss ratio under that classification is but 11.45 percent, while under mercantile risks, which means brick and frame mercantiles of moderate size, this company carries \$12,600,000 insurance, and the loss ratio was 70.80 percent.

Surely sufficient evidence has been submitted to show that office buildings are contributing more than their share of the premiums to help carry the losses on more hazardous risks.

From a mass of correspondence received from Business Managers all over the country, I am of the opinion that in localities where there has been agitation, the office buildings have been given a better rate than they would have otherwise received. And greater will be the results obtained "if," as a western manager wrote, "property owners can unify their efforts; for then, with a solid front, we can secure reforms which will bring us results possibly unthought of to any of us here."

I maintain that if the insurance companies of this country will employ the rigid policies—or practices—of the New England Factory Mutuals, the fire insurance rates will be forced down away below their present level, because the losses will be materially decreased. Contrast the frequent inspections of the Factory Mutuals with the infrequent and oftentimes not at all inspections of the old line companies. Then contrast the losses of the one with the other. It is prevention from fire, which inspection will help give us, that we want far more than the indemnity in case of loss.

Contrast the refusal of the Factory Mutuals to take the risks made hazardous by exposure and the greed of the old line companies to write them and then again contrast their losses.

If a garage is stuck up alongside of your beautiful and modern fireproof structure, a few cents are immediately tacked on your rate. How long would you be exposed to that risk if the garage instead of the fireproof structure were compelled to stand the penalty of exposure in the shape of increased premiums? And such a system is not impossible, but just.

New Fire Schedule of Fireproof Office Buildings

By Cullen Brown

FIRE INSURANCE, which originated in betting between merchants as to whether their ships would arrive safely or not, has, through modern commercial demands, grown into an enormous commercial proposition, until now practically every risk is subject to a schedule in which charges are made for conditions which experience has proved to the companies is hazardous, and credits for certain conditions are given in order to form an equitable rate. For instance, a building with a fire escape is given a credit for same, for it affords this protection to that building that, if a fire occurs in the adjoining building, the firemen have a safe platform from which to fight the flames, thus not only aiding the fire company to put out the fire in the exposed building, but also preventing the fire from doing damage to the building equipped with the fire escape.

Years of experience and comparison of losses have enabled the companies to prepare a schedule more or less perfect, which will give a rate on the modern fireproof office building. This schedule covers three closely printed pages, starting out with the area and ending with a reduction for eighty percent coinsurance clause.

In order to establish a basic rate, the first consideration is the height and area of the building, the next consideration, the occupancy. It is very plain that an open space 20x100 feet cannot contain as much inflammable material or cause as severe a fire as a space 40x100 feet, and it is also very plain that in a building two stories high a fireman can fight a fire in any portion of the building without trouble, whereas in a building sixteen stories high it is very difficult to get water to the top floor. As for occupancy, a building which is filled with inflammable material, such as furniture, open stock of dry goods, or something similar, is much more susceptible to fire than a building filled with pig iron; of course, between these two supposed occupancies there is a wide difference, and the insurance companies have tried to make a proper allowance for all.

A modern fireproof office building is divided into many small spaces by non-combustible partitions; thus a fire would have no chance to gain any great headway in comparison with, say, a department store, in which the fire can run from one end of a floor to another in a very short space of time.

Let us take a typical office building and go through the schedule, supposing the building to be 100x100, of sixteen stories and basement, we have a basic charge of 45.5 cents. As the two lower floors are presumed to have fireproof partitions between the rooms and above the second floor, ordinary non-combustible divisions, a credit is given of 3.2 cents, making the net basis charge 42.3 cents; as the two lower floors are usually given up to commercial purposes, the charge would be 15 percent of the basis rate for these two floors. The outside walls are supposed to be curtain walls, 12 inches thick, and if they are so, no charge is made. If these walls, instead of being brick,

are constructed of stone, tile or terra cotta, there is an additional charge, owing to the greater damagability of these. Wooden frames for bay windows would also be charged for. Any skylights, not wire glass and metal frames, would also be charged for. Open well holes, light shafts, or courts, open to the sky, owing to the danger of brands from burning buildings being carried through the air and deposited in such open spaces, causing interior fires, would bring a further charge. Floors are supposed to be constructed of reinforced concrete, with nailing strips imbedded in fireproof material; wooden floors on concrete, however, are allowed without any charge. Two open stair cases are allowed and one bank of open elevators without charge.

Presuming that the building has the ordinary hazards of a fireproof office building, such as a restaurant with cooking done by gas, no coal stoves, men's furnishing store, drug store, bank, railway ticket office and cigar store, which occupancies are usually found in a large office building, there would be a charge for the first two floors, where these occupancies are supposed to be, of 14 percent of the basis rate; as stated above, the partitions are presumed to be non-combustible, resting on a fireproof floor, anchored at both top and bottom. The stairs are supposed to be metal, and the threads slate with a metal sub thread. Heat is supposed to be steam in basement engine room, cut off from the rest of the building. Of course, lighting is supposed to be electric light with wiring up to standard. For instance, I have an example of two buildings in which a charge of 5 cents was made for deficiencies in electric light wiring. All roof houses are supposed to be fireproof. Of course, the fireproofing of the beams, trusses, etc., is supposed to be standard.

Summing it up, we find a charge of 15 percent for the commercial occupancies on the first and second floors under the area charge and 14 percent under the communication charge, inasmuch as it is presumed that these various stores, restaurants, etc., will have unprotected openings between themselves and the rest of the building. There is also a general charge of 38 percent as the penalty for occupancy; by this it is meant that a haberdasher store or restaurant and other commercial occupants have enough inflammable material in an open space, so that a fire could gain enough headway to cause considerable damage to the building. This gives us a total of 67 percent of the basis rate of 42.3 cents and brings the total up to 70.6 cents. There is a credit in fireproof buildings where there is no stone or marble interior decorations; this would not, however, apply to the average office building; neither would water-tight floor ways, for which there is a credit, nor fireproof cut-offs. There is, however, a credit for an inside four-inch stand pipe with a 1½-inch hose of 3 percent of the basis rate and a credit for an outside fire escape with outside stand pipe of 4 percent. There should be a credit for a watchman reporting to a central station. However, the new schedule makes no allowance for this, as, under their rules, a watchman must make his rounds every hour, and in a 16-story building 100x100 it would require at least two men patrolling the building constantly all night, and in case of the plant not running twenty-four hours would require them to climb up sixteen stories and be on the move constantly, which evidently is not practical and eventually I believe this rule will be amended so that an inspection at 10 p. m., 12 m., and 6 a. m., with an hourly report in the basement, will be regarded as sufficient.

The credit on the stand pipes and fire escape being 7 percent of the basis rate, we have a net rate of 67.8 cents.

We now take up the point of exposure charges. If the exposing buildings are under three stories and the openings in the office buildings are protected with wire glass with metal frames, there is no charge; if, however, these openings are not protected, a charge of 5 percent based on the rate of the exposing buildings is made; that is, if the rate of the exposing building is 1 percent, the charge would be 5 cents; if the rate is $1\frac{1}{2}$ percent, the charge would be $7\frac{1}{2}$ cents. If the exposing buildings exceed three stories, a wall damage charge is made on the same basis as above.

A great many people do not recognize the great damage a small fire can cause to terra cotta or stone. An instance in my experience occurred the other day in which a client of ours was erecting a fireproof bakery; he had his terra cotta piled on a vacant lot near the building and protected from abrasion by straw, as terra cotta is usually packed. About 11 p. m. someone threw a lighted match or something of a similar nature into the straw, which caught fire, and, although the fire department was only three blocks away, the resulting blaze damaged 50 percent of the terra cotta so that it could not be used. You can readily see what damage a fire in a six-story building, filled with the ordinary combustible material, would cause to the stone or terra cotta trim of an office building.

Allowing that this typical office building should have one exposure of a three-story building with no protection and an exposure of a six-story office building from which the supposed office building was protected, each of which rated at 1 percent, we have an additional charge of 10 cents, or a total built up rate of 78 cents.

Insurance companies base their rates on the supposition that everyone, for their own protection, will carry at least 80 percent of the value of the goods or buildings insured, but it has been found that in very many cases a \$500,000 fireproof office building will only carry about \$50,000 of insurance to take care of minor fires, such as are classed as "Awning" or "Waste Paper Basket" fires, and, in consequence, the volume of premium is not enough to take care of the conflagration hazard and to force the assured to carry a proper amount of insurance, the basis rate is made very high, but a 50 percent credit is given in case the assured will carry insurance to the amount of 80 percent of the value of the building; therefore, this clause attached will bring the rate down to 39 cents for five years; for three annual premiums, it will further reduce the rate to 23.4 cents.

Insurance companies further allow term insurance, that is, you may pay an amount equal to three years' premium and receive a policy which will cover this risk for term of five years; this will further reduce the rate to 23.4 cents.



First Official Report of the Fire Insurance Committee of Building Owners and Managers

By Charles E. Doty, Chairman

THE subject of fire insurance has become a most popular one with organizations throughout the entire country. One authority said that every state legislature in session last winter passed, or at least considered, legislation affecting fire insurance. So persistently has the public delved into the subject that it is satisfied that it knows its weaknesses, and it has, with this knowledge, put the fire insurance companies entirely on the defensive.

In November, 1910, the New York State legislature started an investigation of the fire insurance companies which opened the eyes of the public to the knowledge that the insurance companies are running their business on a gamble with fate, and not on a scientific basis of correct rating of fire risks.

Everything else being equal, there is no reason why insurance rates in Detroit should be higher than in Cleveland, and yet the Penobscot building in Detroit is 42 cents and the Chamber of Commerce in Cleveland is 25 cents. That is one of the inequalities in rates that your committee has discovered, and it is inequality in rates, not only in different locations, but in the different classes of risks, and hosts of other complaints that have caused the public to clamor for the regulation of the fire insurance companies.

Your committee acknowledges that some insurance reformers may be too radical. The companies, themselves, do not welcome house cleaning at all. So whatever may be the course pursued, we hope it will be the one which will bring lower rates to the insured, and enormous reduction in our annual fire waste and the continuance of our valued institutions, the fire insurance companies, on a scientific basis and an equitable one to all classes of risks, as well.

Congressman Jackson has introduced a resolution calling for an appropriation of a quarter of a million dollars to cover the expense of investigating the loss of life and property by fire, and the rates charged for fire insurance. We believe that if passed, this resolution will bring about a reasonable reduction in rates on our buildings over the entire country. The classes of risks which bring the greatest losses should bear the highest rates. We argue and have compiled data with which to substantiate our claim, that the class or risk which we represent does not contribute to the fire loss to an appreciable degree, and should be so rated.

This national investigation has a distinct advantage over state investigation. Fire insurance is in no sense local. The San Francisco disaster affected every section from that city clear to Eastport, Me. An institution so far reaching should be investigated, therefore, by the national government, rather than by the several states. And neither should the insurance

companies be compelled to compile data for forty-seven different states that could be more effectively used by the national government.

We give Congressman Jackson's resolution in full:

62d Congress, 1st Session.

H. J. Res. 97.

In the House of Representatives. May 12, 1911.

Mr. Jackson introduced the following joint resolution, which was referred to the committee on appropriations and ordered to be printed:

Joint Resolution.

Providing for an investigation for the purpose of collecting statistical data relating to the loss of life and property by fire in the United States, the reasonableness of rates charged for fire insurance, and the relation of such rates to the causes of fire losses, and making an appropriation to meet the expenses thereof.

Whereas, the loss of life and property by fire in this country is abnormal, and is to a large extent removable by economic treatment, under suitable laws and governmental supervision; and

Whereas, there is necessity for investigation of the causes of such losses by fire and the collection of statistical data relating thereto, as well as the relation to such losses of rates charged for fire insurance, to the end that the people of the several states of the United States may adopt proper expedients to prevent such losses and to secure fire insurance at reasonable cost, as well as to promote the education of their citizenship in preventing conflagration; and

Whereas, the several states, in their efforts to deal with these problems and the regulation of fire insurance rates, are meeting with many obstacles, in that there is no central source of information from which facts concerning the causes, number, and history of fires can be obtained, tabulated, and analyzed, and their relation to reasonable fire insurance rates made manifest; and

Whereas, the determination of reasonable fire insurance rates for any state requires a consideration of the facts and history of fire losses in all the states, and such work will be greatly facilitated and made more perfect by a central bureau of research, which must of necessity be conducted by the Federal government: Now, therefore, be it

Resolved, by the Senate and House of Representatives of the United State of America, in Congress assembled, That the President of the United States be hereby authorized and directed to employ suitable experts and assistants and to cause an exhaustive inquiry to be made into all available facts bearing upon the loss of life and property by fire and upon the means of preventing such loss in the future. Inquiry shall also be made to show what proportion the loss of property by fire bears to the whole amount of property insured in the several states, and all other facts necessary to establish proper classifications and reasonable fire insurance rates throughout the United States. The President is also directed to invite the co-operation of the states in the investigation by ordering the accumulation of such reports of the current experience of fire insurance companies as the experts employed shall find necessary for the work to be accomplished. Said experts shall report to the President the findings of the analysis of the facts examined by them, to the end that the states shall be aided in making manifest the reasonableness of fire insurance rates and the efforts to restrict

fire waste. At some date within two years from the date of their appointment, said experts shall make a full report of what has been found by them and shall set forth what should be done to establish a permanent bureau dealing with the problems of fire waste and the proper measurement of fire hazard, for the establishment of fire insurance rates.

Sec. 2. That the sum of two hundred and fifty thousand dollars be appropriated from any moneys not otherwise appropriated to pay the expenses of the inquiry provided for by this resolution.

In behalf of this joint resolution, your committee submits the following resolution and urges its adoption. A similar resolution has already been adopted by the Building Managers' Association of Chicago and Seattle.

(Copy.)

Whereas, the Secretary of the Interior has recently brought to public attention the fact that the fire waste in the United States is excessively large and is constantly increasing, and

Whereas, no adequate records of such fire waste now exist, and

Whereas, only an exhaustive investigation of such fire waste and compilation of such records will disclose the cause and thereby suggest a remedy for the same, and

Whereas, such an exhaustive investigation can be properly conducted only by the Federal government, therefore be it

Resolved, That the National Convention of Building Managers, assembled in Cleveland, most heartily endorses and approves the H. J. resolution ninety-seven, introduced by Hon. Fred S. Jackson of Kansas, and pledges its moral support to the furtherance of said resolution, and be it further

Resolved, That a copy of these resolutions commending his action in introducing this worthy legislation be sent to Congressman Jackson, the Secretary of the Interior, and to every other member of Congress, requesting their best endeavors in behalf of the aforesaid resolution.

Your committee prepared a form which they sent out to some 2,000 building managers throughout the country. The result of the information secured on these blanks has been tabulated and is submitted as a part of our report.

It was not compulsory on the part of anyone to give the information requested and for that reason we think we were very successful in securing as many returns as we did.

Your committee personally presented these figures to Mr. J. V. Parker, manager Western Actuarial Bureau, Chicago, as our argument for lower rates. Mr. Parker very pleasantly and very frankly advised us that up to the time present the insurance companies have not rated modern office buildings on a schedule planned to meet the conditions which they present, but that there is in process of perfecting the "Parker Schedule."

The "Parker Schedule" is the product of Mr. J. V. Parker, from whose letter of July 6th, 1911, we quote the following:

"Owing to the demands upon my office recently on account of the new laws becoming effective in different states, I have been unable to complete my publication for measuring the fire hazard of buildings of fireproof construction.

"I succeeded in having a revised edition printed, but up to the present time have not been able to complete my test applications. Therefore, I am unable to say whether or not I have succeeded in eliminating all the inconsistencies in this edition. I think, however, while I may not have succeeded

Recapitulation of Data Secured on Modern Office Buildings, Valued at Over One Hundred Million Dollars, by Fire Insurance Committee of National Association of Building Managers

Submitted at Convention in Cleveland, July 11, 1911.

Losses in Baltimore conflagration secured from report of committee investigating losses to fire resistive buildings and undoubtedly representing the insurance companies. The losses of the three additional office buildings in the San Francisco conflagration were not secured in time to be submitted.

EASTERN STATES, EXCLUSIVE OF BALTIMORE CONFLAGRATION										
Bldg. Age.	Exposures— Protected Not Prot.	Standpipe and Hose	Annual Rate	3-Yr. Rate	5-Yr. Rate	Co-insurance.	Cost of Building.	Insurance Carried.	Premium Paid.	Losses Paid.
1 1896	Protected	Yes	.85	.....	.....	90%	\$300,000	\$10,000	\$1,275	....
2 1902	Protected	Yes	.30	.....	.....	90%	190,000	165,000	3,760	....
3 1906	Protected	Yes	.45	.....	.....	.....	750,000	480,000	3,840	.....
4 1891	No	Yes	.45	.....	.....	.....	420,000	336,000	6,048	\$1,685
5 1904	No	Yes	.39	.78	1.17	.....	.....	.....	.....	.....
6 1895	No	No	.....	.....	.....	.....	.....	95,000	.....	.....
7 1906	No	Yes	.71	.....	.....	80%	450,000	300,000	2,148	.....
8 1905	No	Yes	.57	.....	.....	.....	550,000	400,000	11,440	.....
9 1905	Protected	Yes	.30	.60	.....	80%	100,000	80,000	960	.....
10 1906	No	Yes	.25	.50	.75	80%	225,000	180,000	1,350	.....
11 1895			.....	.22	.....	80%	3,750,000	3,100,000	17,000	1,250
12 1901			.....	.25	.....	80%	3,375,000	2,700,000	12,000	1,000
13 1903			.....	.33 1/2	.....	80%	3,750,000	3,000,000	34,000	.....
14 1903			.....	.....	.784	80%	1,350,000	1,100,000	10,000	1,000
15 1903			.....	.....	.352 1/2	80%	1,000,000	900,000	3,500	.....
16 1903			.....	.....	.36	.....	1,000,000	1,000,000	8,000	.....
17 1904			.....	.62 7/8	.....	80%	190,000	150,000	2,000	.....
18 1905			.224	.48 2/5	.....	80%	400,000	325,000	3,600	.....
19 1904			.....	.38 2/5	.....	80%	600,000	480,000	8,000	1,000
20 1893			.....	.29 1/2	.....	80%	600,000	485,000	4,000	.....
21 1890			.....	.29 1/2	.....	.....	200,000	200,000	6,000	.....
22 1897	Protected	Yes	.28	.70	1.12	80%	1,400,000	1,000,000	11,500	.....
23 1903	Protected	Yes	.191	.47 7/8	.764	80%	300,000	300,000	3,200	.....
24 1896	No	Yes	.127	.31 1/5	.508	80%	1,500,000	1,250,000	4,000	500
25 1890	No	Yes	.27	.....	.....	.....	500,000	480,000	.....	.....
26 1899	No	Yes	.282	.70 1/2	1.138	80%	1,000,000	400,000	10,000	700
27 1897	No	Yes	.....	1.08	.....	.....	.....	65,000	1,950	.....
28 1906	No	Yes	.37	.92 3/5	1.48	80%	1,000,000	500,000	22,118	.....
		Yes	.25	.50	.75	80%	225,000	180,000	1,350	.....
										\$2,500 carried outside.
										Also perpetual insurance.
										\$7,135
										\$25,195,000 \$19,661,000 \$193,039

CENTRAL STATES—BUFFALO-PITTSBURG TO MISSISSIPPI RIVER

Bldg. No.	Age.	Exposures— Protected Not Prot.	Standpipe and Hose	Annual Rate	3-Yr. Rate	5-Yr. Rate	Co-insurance.	Cost of Building.	Insurance Carried.	Premium Paid.	Losses Paid.
1	1806	No	Yes	.18	.45	.72	80%	\$1,250,000	\$1,000,000	\$9,000	....
2	1890	No	Yes	.31	.775	1.24	80%	200,000	150,000	5,115	....
3	1806	Protected	Yes	.18	.375	.60	80%	475,000	475,000	3,562	....
4	1807	Protected	Yes	.18	.....	.72	80%	4,350,000	2,500,000	18,000	....
5	1808	Protected	Yes	.17	.....	.....	80%	2,350,000	1,350,000	5,987	....
6	1809	Protected	Yes	.37	.80	1.23	80%	2,500,000	1,000,000	1,056	....
7	1898	Protected	Partially	.67	.....	.....	80%	600,000	480,000	.....	17c plus 20% for 60% clause.
8	1801-1896	Protected	Yes	.67	.....	.....	80%	3,000,000	2,500,000	62,906	\$1,276
9	1800	No Exp.	Yes	.23	.....	1.17	80%	.....	720,000	.....	1,000
10	1895	No Exp.	Yes	.19	.....	.....	80%	1,600,000	1,250,000	36,807	1,650
11	1894	Yes	Yes	.23	.....	.....	80%	.....	300,000	14,580	....
12	1807	Yes and No	Yes	.23	.....	.....	80%	450,000	350,000	2,890	....
13	1804-1910	Protected	Yes	.47	.....	.....	80%	.....	750,000	23,300	....
14	1893	Partly	Yes	.25	.625	1.00	80%	225,000	180,000	15,500	....
15	1893	Protected	Yes	.22	.55	.88	80%	.....	750,000	29,700	5,000
16	1893	Protected	Yes	.45	.....	.....	80%	450,000	200,000	16,200	2,000
17	1807	Protected	Pipe—No Hose	.....	.....	.936	90%	.....	135,000	1,236	37
18	1897	Protected	Yes	.....	.....	.....	80%	110,000	90,000	8,400	500
19	1894	Partially	No	.69	.....	2.07	80%	550,000	275,000	30,000	500
20	1908	Protected	Pipe—No Hose	.....	.....	.....	80%	.....	None	.....	....
21	1909	Protected	Yes	.43	.....	1.29	80%	250,000	150,000	2,000	110
22	1896	Protected	Yes	.40	.80	1.20	80%	1,000,000	700,000	27,200	1,500
23	1905	Protected	Yes	.42	.84	1.26	80%	.....	600,000	10,080	485
24	1905	Protected	Yes	.40	.80	1.20	No	.....	412,000	4,944	....
25	1891	Exp.—60 ft.	No	.50	.50	1.50	No	313,000	150,000	14,250	....
26	.....	.....	.....	.....	.....	.....	.....	.....	None	.....	....
27	1903	Yes and No	No	.....	.....	1.92	60%	250,000	165,000	.....	Premium not known. Loss \$6,500.
28	1901	Protected	Pipe—No Hose	.....	.....	1.29	60%	500,000	300,000	3,220	289
29	1907	Protected	Yes	.43	.86	1.02	.....	400,000	250,000	2,550	Insurance record for last 5 years.
30	1894	No	Yes	.45	.90	1.35	.....	500,000	300,000	10,320	....
31	1890	No	Yes	.45	.90	1.35	.....	1,600,000	300,000	10,800	....
32	1890	Protected	No	.45	.90	1.35	.....	100,000	40,000	7,200	....
33	1809	Protected	No	.....	.....	.....	80%	375,000	300,000	2,700	....
34	1911	Protected	No	.25	.50	.75	80%	850,000	650,000	4,875	....
35	1906	Protected	Yes	.37	.74	1.11	.....	700,000	200,000	1,480	....
36	1896	Protected	No	1.35	2.70	.....	.....	100,000	50,000	5,000	Old type building.
37	.....	.....	.....	.....	.....	.....	.....	.....	247,000	.....	....
38	1900	Alleys	Yes	.25	.50	.75	80%	.....	.....	13,113	181
39	1905	Protected	Yes	.42	.....	.....	80%	920,000	150,000	3,360	....
40	1902	Protected	Yes	.38	.76	1.14	80%	.....	350,000	.....	....
41	1900	Protected	Yes	.26	.52	.78	80%	1,000,000	700,000	15,000	1,370
42	1904	Protected	.....	.....	.....	.....	.....	.....	None	.....	....
43	1905-1897	No	Yes	.65	1.30	1.95	.....	.....	150,000	5,000	199
44	1907	No	Yes	.35	.70	1.05	60%	500,000	400,000	5,600	....
45	1896-1901	No	No	.35	.70	1.05	.....	900,000	250,000	10,000	200
46	1910	Protected	Yes	.90	.....	.....	.....	480,000	255,000	2,285	....
47	.....	.....	Yes	.36	.72	1.08	80%	725,000	610,000	12,000	....
48	1902	No	Yes	.50	1.00	1.50	80%	.....	200,000	4,000	....
49	1907	Protected	No	.80	.80	1.20	80%	1,000,000	300,000	10,000	....
50	1895	Protected	Yes	.36	.....	.....	80%	686,000	500,000	5,093	....
51	1905	Protected	Yes	.36	.....	.....	80%	.....	.....	.....	....

CENTRAL STATES—BUFFALO-PITTSBURG TO MISSISSIPPI RIVER—Continued.

Bldg. Age.	—Exposures—		Standpipe	Annual Rate	3-Yr. Rate	5-Yr. Rate	Co-insurance.	Cost of Insurance		Premium Paid.	Losses Paid.
	Protected	Not Prot.						Building.	Carried.		
52 1902	Protected		Yes	.30	.60	.90	80%	500,000	None	7,200	.....
53 1909	Protected		Yes	.39	.78	.....	80%	200,000	160,000	1,600	.....
54 1896	Protected			.30	.60	.....	.....	800,000	640,000	3,840	\$1,811
55 1896				.....	.....	.....	.....	100,000	100,000	2,800	.....
57 1911		No	Yes	.....	.64	.....	.....	250,000	125,000	550	.....
58 1907	Protected		Yes	.15	.....	.80	90%	1,000,000	400,000	1,800	.....
59 1903	Protected		Yes	.....	.....	.....	.....	600,000	482,000	3,856	.....
60 1898-1911	Protected	No	Yes	.....	.....	.80	100%	900,000	800,000	10,800	.....
61 1907		No	Yes	.32	.66	.99	75%	1,800,000	900,000	8,310	.....
62 1896	60 ft. above str.		Yes	.27½	.....	.....	80%	2,000,000	1,000,000	4,400	2,400
63 1896	Protected		No	.31	.....	.....	80%	400,000	.....	12,000	1,000
64 1906	Protected		Yes	.....	.....	.....	80%	350,000	350,000	5,760	.....
65 1886	Protected	No	No	.45	.90	1.35	.....	280,000	100,000	6,750	.....
66 1898	Protected	No	Yes	.....	.....	2.37	60%	500,000	360,000	8,532	.....
67 1902	Protected	No	No	.49	.98	.....	.....	182,000	50,000	2,023	58
								\$38,276,000	\$28,101,000	\$594,740	\$21,576

Insurance carried only since 1909.
Insurance carried only for 5 years.
*Board rate—Written at .22.

One small loss.

5-year policy by present owners.

58x115, 8 Stories—Ext. fire.

SOUTHERN STATES.

Bldg. Age.	—Exposures—		Standpipe	Annual Rate	3-Yr. Rate	5-Yr. Rate	Co-insurance.	Cost of Insurance		Premium Paid.	Losses Paid.
	Protected	Not Prot.						Building.	Carried.		
1 1908	Protected		Yes	.45	.90	1.35	.....	\$451,000	\$100,000	\$1,350	.....
2 1903	Protected		Yes	.40	1.00	1.60	75%	170,000	100,000	.....	.....
3 1906	Protected		Yes	.....	1.48¼	.....	75%	250,000	122,000	3,606	.....
4 1909	Wire Glass		Yes	.50	1.25	.....	75%	225,000	135,000	1,687	.....
5 1906	Metal Frames		Yes	.55	1.375	.....	75%	200,000	135,000	2,970	\$250
6 1906	Metal Frames, Wire Gl No		Yes	.60	1.50	.....	75%	200,000	135,000	.....	.....
7 1909			Yes	.35	.875	1.40	90%	230,000	205,000	1,793	.....
8 1903	No Standpipe		No	.50	.....	2.00	75%	515,000	350,000	14,000	.....
9 1906	No	No	Yes	.30	.75	1.20	75%	1,600,000	750,000	9,900	.....
10 1901	No	No	Yes	.50	.....	2.00	50%	700,000	200,000	10,000	106
11 1898	No Openings		Yes	.30	.75	1.20	75%	250,000	160,000	6,240	550
12 1905	Protected		Yes	.40	.....	.....	75%	600,000	400,000	9,600	.....
13 1902	Protected		No	.50	1.00	.....	.....	150,000	150,000	6,750	3,600
14 1911	Protected		Yes	.....	.....	.....	.....	200,000	.....	.....	.....
15 1907		No	No	.....	.....	.....	.....	45,000	28,000	1,815	.....
16 1911	Protected		No	.....	.....	.....	.....	650,000	300,000	.....	.....
17 1908	Protected		Yes	.....	.....	1.20	.....	200,000	50,000	600	.....
18 1911	Protected		Yes	.20	.50	.80	.....	260,000	90,000	180	.....
19 1911	Partially		Yes	.....	1.00	.....	.....	135,000	None	.....	.....
20 1909	Protected		Yes	.40	.....	.....	.....	175,000	100,000	800	.....
								\$7,206,000	\$3,510,000	\$70,391	\$4,506

MISSISSIPPI RIVER WEST TO ROCKY MOUNTAINS, INCLUDING SOUTHWEST.

Bldg. Age.	Exposures— Protected Not Prot.	Standpipe and Hose	Annual Rate	3-Yr. Rate.	5-Yr. Rate.	Co-insurance.	Cost of Building.	Insurance Carried.	Premium Paid.	Losses Paid.
1 1910	Protected	Yes	1.14	2.28	.075	....	\$350,000	\$200,000	\$150	....
2 1902	No	Yes	1.54	3.42	....	....	465,000	400,000	4,000	....
3 1907	No	Yes	.25	.60	.36	....	1,800,000	500,000	4,500	\$20,000
4 1902	Protected	Yes	.30	.76	.90	....	750,000	425,000	4,250	....
5 1888	No	Yes	1.20	1.20	....	....	180,000	100,000	2,500	....
6 1889	Protected	Yes	.80	1.60	2.40	....	130,000	100,000	2,400	....
7 1910	Protected	Yes	.32	.64	.96	....	825,000	510,000	3,264	....
8 1889	No	Yes—No Hose	.40	.80	....	....	500,000	300,000	5,400	....
9 1905	No	Yes	.90	1.80	2.70	....	75,000	30,000	1,080	....
10 1910	Protected	Yes	.165	.33	....	....	60,000	43,000	627	....
11 1910	Protected	Yes	.54	1.08	1.62	80%	350,000	300,000	2,430	....
12 1910	Protected	Yes	.48	.96	1.44	80%	300,000	....	1,440	....
13 1900	Protected	No	1.69	....	....	80%	75,000	45,000	2,196	....
14 1894	Protected	Yes	1.51	....	....	50%	100,000	52,500	15,500	3,000
15 1907	Protected	No	.48	....	....	80%	80,000	64,000	800	....
16 1910	Protected	Yes	...	....	1.56	90%	150,000	135,000	1,701	....
							\$5,630,000	\$3,237,000	\$55,238	\$23,978

PACIFIC COAST EXCLUSIVE OF SAN FRANCISCO CONFLAGRATION.

[illegible]

LOSSES IN SAN FRANCISCO CONFLAGRATION.

	No	Yes	.52	.....	....	50%	\$1,200,000	\$400,000	\$6,240	....	750,000 loss before insured.
1	Protected	Yes	.54	.....	....	.....	1,400,000	800,000	.....	540,000	Carried ins. since 1904.
2		Yes	.52	.....	....	.....	1,500,000	800,000	30,000	103,500	
3		No	1.00	.....	....	.....	600,000	275,000	8,395	100,000	
4		No		.....	....	.....		
							\$4,700,000	\$2,375,000	\$44,635	\$743,500	

entirely in getting it on a working basis, that it is in pretty fair shape, and have sent it out to my regular subscribers, suggesting that they use it cautiously for a few months and at the end of that time favor me with such suggestions as they may have to make after putting it to a practical test.

"I had daily expected to get these test applications in shape so that I could submit same to you showing average results, but owing to the many difficulties encountered recently, I have not succeeded in doing so up to the present time, although I hope to have them completed within a week or ten days.

"As I am unable to furnish you with any tabulation showing the average effect on existing estimates, it occurred to me that possibly the effect on a dozen or fifteen specific risks, with a little idea of the class of buildings, might be of interest. I therefore had such a list prepared, copy of which I am enclosing herewith. While the majority of results quoted in this list show a reduction, I do not want you to get the impression that that is going to be the result on every building, because there will be some increases on badly exposed buildings or hazardously occupied buildings, or even on poorly constructed buildings. There will also be some increases at certain points where the method that has been followed in the past for making estimates on buildings of this class of construction produced generally lower figures than the methods followed at some other point. You, of course, understand that no system which places the estimates on any particular class of this kind, on a uniform basis in all cities, can be expected to produce the same results at different points, when the method formerly in use varied materially."

Test Cases Showing Application of "Parker Schedule."

Five-story brick building, plastered walls, occupied by wholesale paper house. Old rate with co-insurance, 28 cents; new rate with co-insurance, 24 cents.

Four-story skeleton steel constructed building, brick curtain walls, occupied by a wholesale hardware house. Old rate with co-insurance, 34 cents; new rate with co-insurance, 29 cents.

Fourteen-story skeleton steel constructed building, brick curtain walls, occupied as a hotel and lower floor mercantile occupants. Old rate with co-insurance, 49 cents; new rate with co-insurance, 38 cents.

One-story brick building, heavy walls, occupied by a bank. Old rate with co-insurance, 22 cents; new rate with co-insurance, 16 cents.

Three-story brick building, heavy walls, marble facing front wall, occupied by a bank. Old rate with coinsurance, 23 cents; new rate with co-insurance, 18 cents.

Ten-story skeleton steel constructed building, brick curtain walls, occupied by bank and offices with restaurant in basement. Old rate with co-insurance, 26 cents; new rate with co-insurance, 20 cents.

Fourteen-story skeleton steel constructed building with brick curtain walls, occupied by bank on lower floors, offices above, and numerous tailor shops distributed through building. Old rate with co-insurance, 45 cents; new rate with co-insurance, 33 cents. New rate includes exposure charge 13 cents net.

Eight-story skeleton steel constructed building, brick curtain walls, occupied by bank on lower floors and printing office on eighth. Old rate with co-insurance, 18 cents; new rate with co-insurance, 13 cents.

Four-story brick building, pilastered walls, with mercantile occupants throughout building. Old rate with co-insurance, 39 cents; new rate with co-insurance, 27 cents.

Four-story skeleton steel constructed building, brick curtain walls, occupied by three machine shops. Old rate with co-insurance, 82 cents; new rate with co-insurance, 36 cents.

Eight-story reinforced concrete constructed building, brick curtain walls, occupied by general storage warehouse. Old rate with co-insurance, 52 cents; new rate with co-insurance, 22 cents.

Four-story reinforced concrete constructed building, brick curtain walls, occupied by lamp manufacturing concern (electric). Old rate with co-insurance, 49 cents; new rate with co-insurance, 36 cents. New rate includes exposure charge of 12 cents net, and after charge of 3 cents net.

Five-story reinforced concrete constructed building, eight-inch brick curtain walls, occupied by washing machine manufacturing company. Old rate with co-insurance, 34 cents; new rate with co-insurance, 28 cents.

Five-story brick building, heavy brick walls, interior supports of reinforced concrete, occupied by a glove factory. Old rate with co-insurance, 30 cents; new rate with co-insurance, 27 cents.

Six-story skeleton steel constructed building, brick curtain walls, occupied by small mercantile firms; lower floor offices, and business college above. Old rate with co-insurance, 33 1-3 cents; new rate with co-insurance, 27 cents.

Five-story skeleton steel constructed building, brick curtain walls, occupied by a hotel. Old rate with co-insurance, 55 cents; new rate with co-insurance, 48 cents.

Six-story skeleton steel constructed building, brick curtain walls, occupied by a hotel and lower floor small mercantile occupants. Old rate with co-insurance, 55 cents; new rate with co-insurance, 46 cents.

Six-story skeleton steel constructed building, brick curtain walls, occupied by bank and offices. Old rate with co-insurance, 20 cents; new rate with co-insurance, 19 cents.

Five-story skeleton steel constructed building, brick curtain walls, occupied by a hotel and lower floor number mercantile occupants. Old rate with co-insurance, 59 cents; new rate with co-insurance, 55 cents.

Six-story skeleton steel constructed building, brick curtain walls, occupied by a hotel and lower floor number mercantile occupants. Old rate with co-insurance, 29 cents; new rate with co-insurance, 26 cents.

Seven-story skeleton steel constructed building, heavy brick curtain walls, occupied by bank and offices. Old rate with co-insurance, 37 cents; new rate with co-insurance, 26 cents.

Four-story reinforced concrete constructed building, brick curtain walls, occupied by a clothing store. Old rate with co-insurance, 21 cents; new rate with co-insurance, 32 cents. New rate includes exposure charge of 6 cents net.

Seven and nine-story skeleton steel constructed building with 12-inch brick curtain walls, occupied by a cold storage warehouse and refrigerating plant. Building divided into four sections. Old rate averaged 25 cents; new rate averages 22 cents. Both with co-insurance.

Three-story reinforced concrete constructed building, brick curtain walls, occupied by a wire and ornamental iron manufacturing company, electrical equipment company, electrical welding company and overall fac-

tory. Old rate with co-insurance, 32 cents; new rate with co-insurance, 36 cents. The increase in rate is caused by an increase in occupancy since last rating.

Two-story reinforced concrete constructed building, brick curtain walls, occupied by ten occupants as automobile garages, salesrooms, automobile supplies and accessories, commercial photographer and fire alarm central station. Old rate with co-insurance, 31 cents; new rate with co-insurance, 42 cents.

Eight-story skeleton steel constructed building, brick curtain walls, occupied all floors by numerous printing, bookbinding and lithographing establishments and also mercantile occupants. Old rate with co-insurance, 88 cents; new rate with co-insurance, \$1.02. New rate includes an exposure charge of 6 cents net and an after charge of 3 cents net.

Eleven-story skeleton steel constructed building, brick curtain walls, occupied as furniture and department store and other mercantile occupants—first to fifth, and offices above. Old rate with co-insurance, 54 cents; new rate with co-insurance, 58 cents. New rate includes after charge of 4 cents net.

Seven-story reinforced concrete constructed building, brick curtain walls, occupied as a cold storage warehouse. Old rate with co-insurance, 17 cents; new rate with co-insurance, 20 cents.

Four-story reinforced concrete pier constructed building, brick curtain walls, occupied by printing, knitting factory and automobile accessories manufacturers. Old rate with co-insurance, 30 cents; new rate with co-insurance, 37 cents. Old rate did not include auto accessories manufacturing.

Seven-story skeleton steel constructed building, brick curtain walls, occupied lower floors by a number of mercantile occupants, offices above. Old rate with co-insurance, 24 cents; new rate with co-insurance, 26 cents.

With but one exception you will observe the test cases quoted under the new schedule show a reduction in rates.

If the new "Parker Schedule" is applied within a reasonable time, we do not recommend that the question of general lower rates be agitated until the effects of the schedule are actually known.

We recommend in the erection of new buildings that the exposure hazard be taken very seriously into consideration, for when the new schedule is issued the basis rate will be very low, but charges will be very heavy for exposures.

We would like to see our successors take serious recognition of the suggestion made at the Washington convention that the exposure charge be charged to the exposure and not against property exposed, and submit to the insurance companies a plan by which this can be put into practice.

CHAS. E. DOTY, Chairman,
CULLEN BROWN,
J. T. CURRAN,
T. E. BAINBRIDGE,
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